the OIL AND GAS JOURNAL

IN-SITU COMBUSTION...
New Oil-Recovery Process—See page 92

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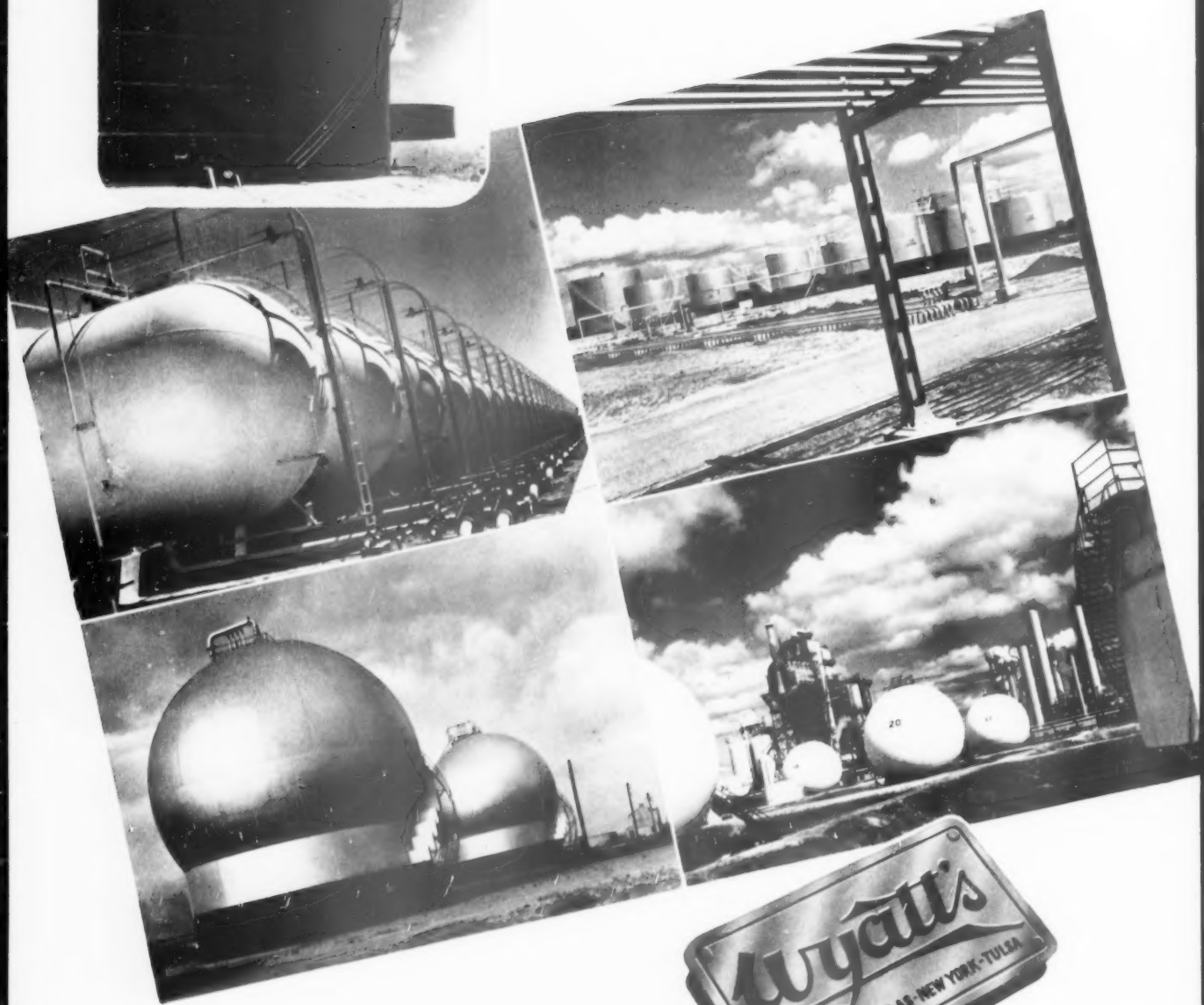

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the OIL AND GAS JOURNAL

AUGUST 10, 1953 VOL. 52 NO. 14

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In Brief . . .

1. INCREASING OIL RECOVERY . . . The quantity of the so-called "unrecoverable heavy oils" in the United States alone is probably in excess of 4 billion barrels. Magnolia Petroleum Co. proposes igniting the reservoir oil so that it will burn in a slowly advancing high-temperature front. By thus raising the reservoir temperature, with consequent reduction in oil viscosity, substantial increase in ultimate oil recovery is possible. Laboratory tests show recoveries of over 60 per cent, frequently as high as 90 per cent, of original oil in place. Field tests are continuing.

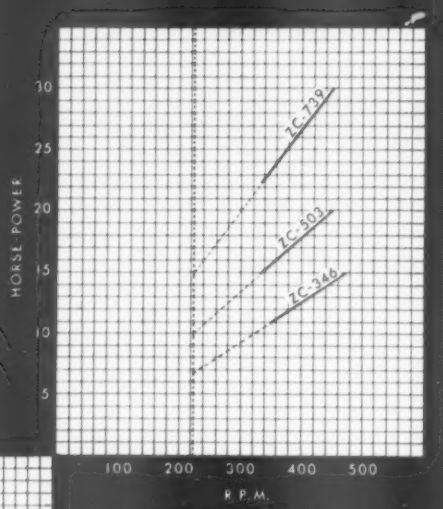
2. DRILLING ACCOUNTING . . . For: (1) improved bidding, (2) faster cost accounting and, (3) better control of operations cost, the drilling contractor would do well to incorporate standard costs in his accounting system. Expenses should be classified under separate control accounts such as direct and indirect rig expense, superintendent and field expense, and overhead. Many of the items involved in rig operations are listed and examples of cost summary and mud and bit record forms are given.

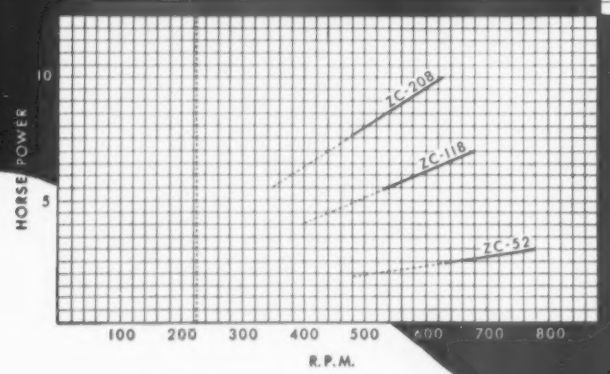
3. PIPE-LINE SUSPENSIONS . . . A chart has been prepared which may be used for quickly solving a number of problems such as: (a) selection of cable size and tower height, (b) determining size of pulling line, and (c) finding length of each hanger. This Southern Counties Gas Co. chart has been used for several practice pipe-line suspensions and recently for design of a 660-ft. emergency crossing of the Santa Ynez River near Lompoc, Calif.

4. CELANESE PAMPA PLANT . . . At its Pampa, Tex., petrochemical plant, Celanese Corp. of America employs a new catalytic air-oxidation process for direct conversion of butane to high yields of acetic acid. Design capacity is 1,800,000 lb. per week of glacial acetic acid. Facilities are available to convert the acid into acetic anhydride. A vinyl acetate plant is in operation with design capacity of 30,000,000 lb. of product per year. Other products from Pampa Celanese include methanol, acetone and butyl acetate.

5. REFINERY POINTERS . . . Refinery charge stock is completely desalted by the use of phenol-saturated spent caustic at the McPherson, Kans., plant of National Co-operative Refinery Association. The spent caustic employed is the effluent stream from the fluid cat cracked gasoline wash. Only minor changes in equipment were required. Applications of wire mesh to solve entrainment problems are dealt with in another report. Reduction of direct losses and prevention of contamination were made possible.

Choose it on these charts...





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Recommended continuous hp. for each size engine is shown by the combined dotted and solid graph line which represents the governed engine speed range for continuous service.

Hp. ratings are for heavy-duty continuous service. Maximum hp. ratings are not shown. Highest speed shown for each size is for heavy-duty pumping service, and in every instance is less than 900 f.p.m. piston speed.

To realize the full advantages of ample flywheel effect, it is best to select the engine to operate at the higher speeds indicated by the solid graph line.

Engine should not operate at speeds less than 225 r.p.m., as limited by magneto impulse coupling.

...and be right!

When you choose a Fairbanks-Morse "ZC" Engine for your pumpers, you're not guessing about horsepower ratings. For "ZC" engines are *not* rated by maximum horsepower . . . they *are* rated by horsepower for *continuous heavy-duty service.*

Fairbanks-Morse conservative ratings give you the data from which you can select with safety, knowing that there is an ample reserve to meet the momentary peak loadings you will encounter.

For the complete story on the "ZC" . . . the engine with the *big double wheels* . . . see your local supply store or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

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None of the customer burner units used in the test were given any special cleaning or reconditioning beyond normal routine servicing. For a control, a similar marketing area was supplied with the same fuel—without the addition of Fuel Oil Additive No. 2.

TYPICAL RESULTS of this test are shown in the photograph on this page. The filters are from a commercial burner consuming about 1800 gallons per month. Prior to the start of the test, this burner had required filter replacement each month. But when operated on the fuel containing 0.01% of Du Pont Fuel Oil Additive No. 2, the filter and burner remained unusually clean and serviceable after a 10,800 gallon thruput.

EVEN BETTER RESULTS could have been expected in this test if the Fuel Oil Additive No. 2 had been added to *freshly prepared* fuel.

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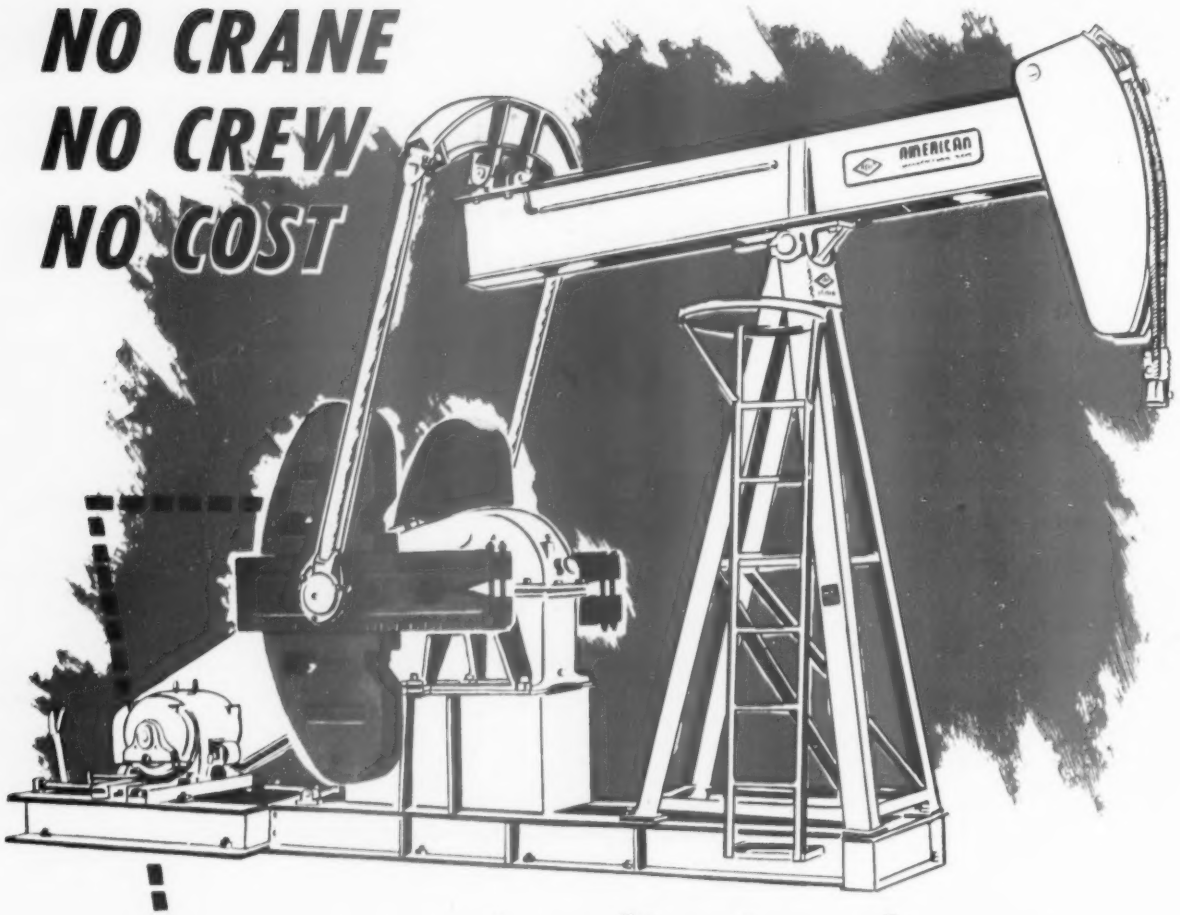

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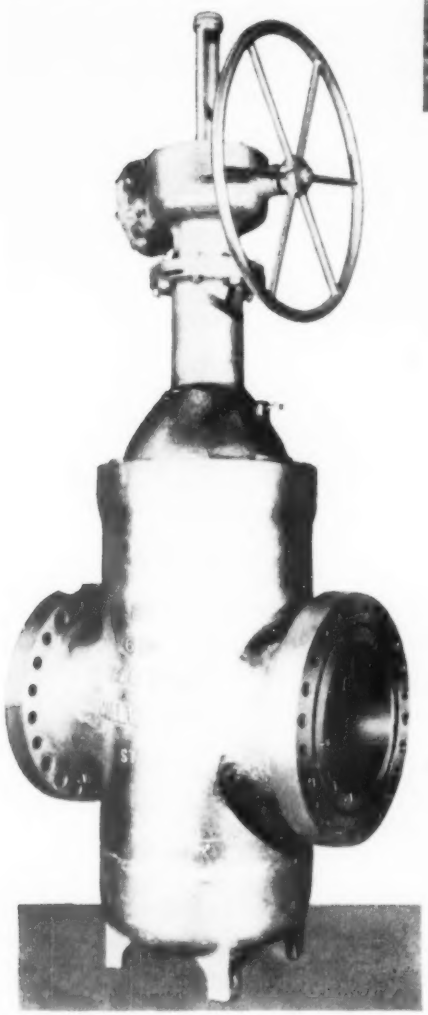
WALWORTH TYPE 49 GATE VALVES

for Oil or Gas

THE PLATTE PIPE LINE COMPANY *has installed Walworth 20-inch Type 49 Cast Steel Pipeline Gate Valves in the main line from Worland, Wyoming to Wood River, Illinois. Illustrated is one of these valves at the Salisbury, Missouri station.*



Walworth Type 49 Cast Steel Gate Valve.

Here's a cast steel gate valve designed, manufactured, and recommended by Walworth for use in lines handling crude, finished products, or natural gas. Type 49 valves are being used successfully in pipelines throughout the United States and in foreign countries.

Walworth Type 49 valves are designed on the through-port principle, require no lubrication, and can be installed in a line without regard to direction of flow. Body and disc ports are accurately machined and have no dirt-accumulating pockets or obstructions to interfere with flow or passage of pigs and scrapers.

Type 49 Cast Steel Gate Valves are made with screwed, flanged, or welded ends in sizes from 2 to 30 inches. These valves can be furnished with a variety of mechanical operators for automatic control. Send for Walworth circular No. 137 for detailed information on Type 49 valves.

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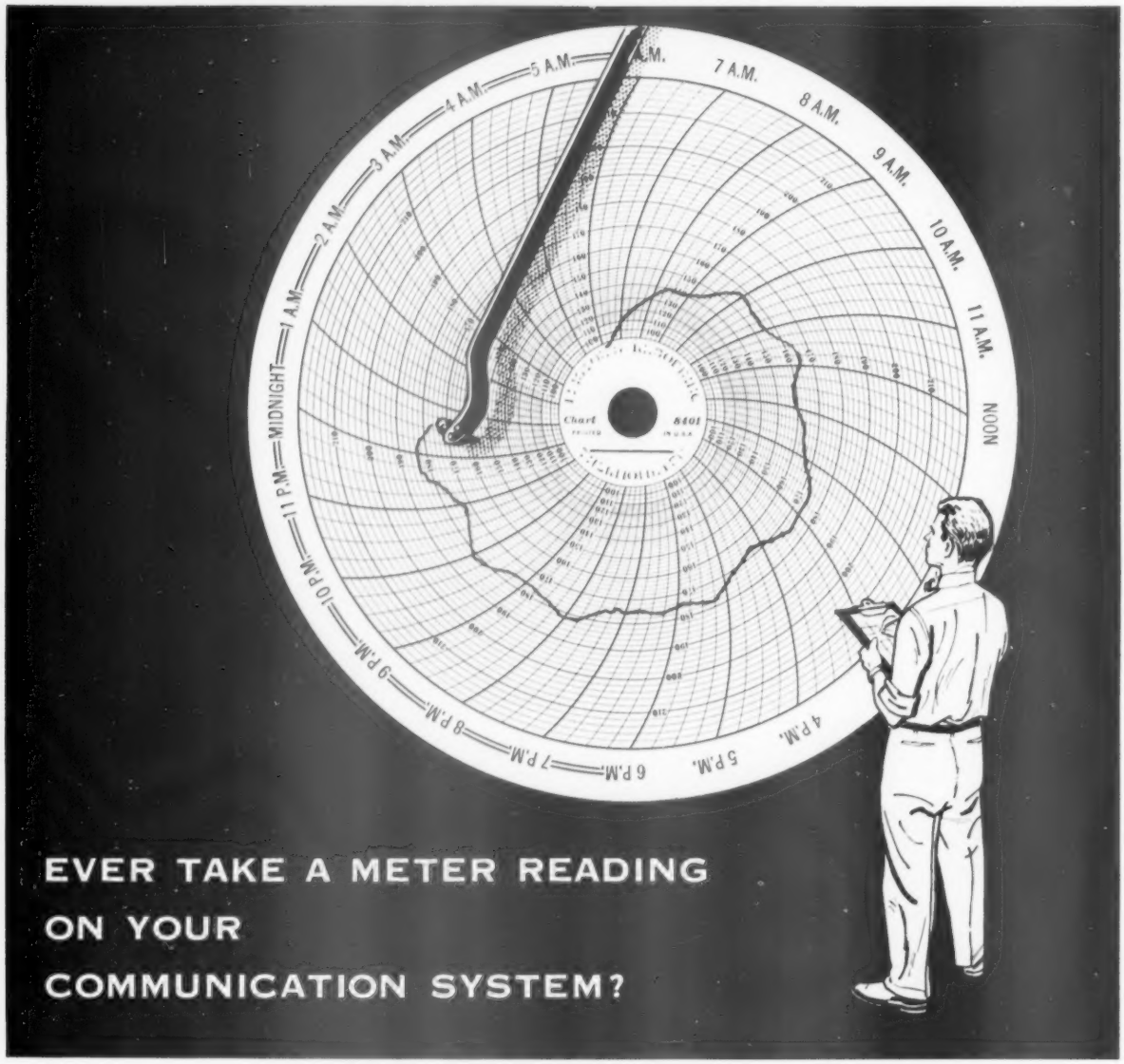

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Mathematically perfect constant support for all positions of travel of high temperature process and steam piping

With the new Grinnell Model R Constant Support, the pipe, its covering and contents, are supplied mathematically perfect support in all positions of travel. In addition, constant support is maintained throughout the full range of field adjustability.

The design of the new Model R provides favorably small ratios between spring force and the supported load, ranging from 1.15 to 1 minimum and 4 to 1 maximum, thereby minimizing bearing stress and prolonging the life of the hanger. This permits hangers which are smaller in size for the loads carried.

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- Anti-friction needle bearings keep friction to a minimum
- Individually calibrated before shipment to support exact load specified
- Requires less head room
- Can be bolted directly to the building structure or suspended by either single or double rods

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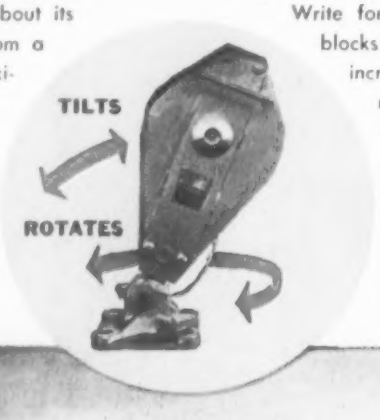
PEDESTAL SHEAVE BLOCK

BIW equipment is engineered with one idea in mind: to let you work over your wells in the most economical way. The BIW Pedestal Sheave Block is mounted on a base on the derrick floor and used in conjunction with tractor or hoisting winch for pulling rods or tubing or for swabbing. The block tilts 45 degrees each way from vertical and rotates about its vertical axis 22 degrees each way from a central position. In this way you get maximum pulling power from your winch with less wear on the wire line because there is no line rubbing on sheave edges or side plates.



TYPE NR-30 FLOOR BLOCK

The NR-30 can be installed anywhere: chained to the derrick foundation, anchored to a "dead man," or fastened down in any desired method where a concrete foundation has not been poured. This block is used with tractor or hoisting winch for swabbing and for pulling rods and tubing at medium depths. Write for the complete story on what these blocks can do to cut your drilling costs, increase your drilling efficiency. Beaumont Iron Works, one of the oldest oil country manufacturers, builds a complete line of drilling and producing equipment.

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C
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B Glass cord, "flexible-braided" body is noncharring; handles pressures up to 200 lbs. psi.
C Tough, sturdy cover provides maximum protection

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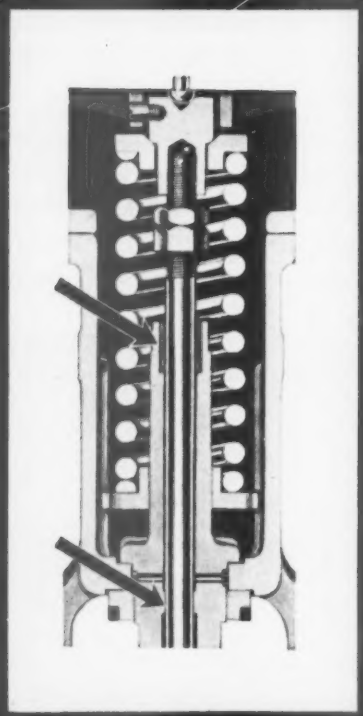
GOODYEAR

THE GREATEST NAME IN RUBBER



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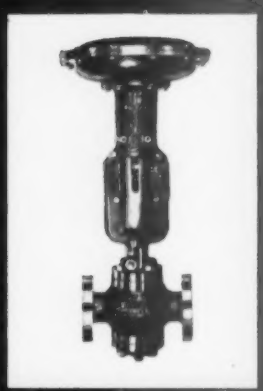

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First in Controls

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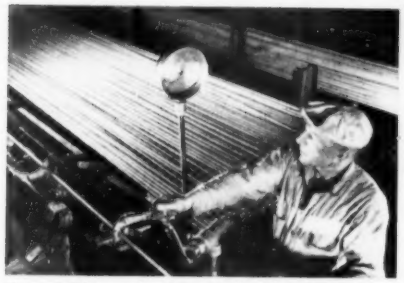
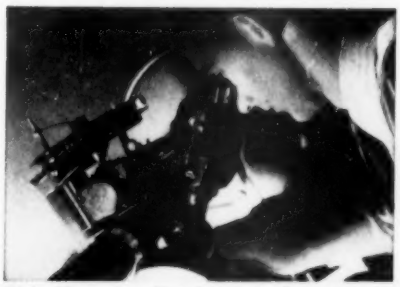


Every Chase Antimonial Admiralty heat exchanger tube is tested to withstand at least 1,000 pounds per square inch water pressure.

Meets every test for Heat Exchanger Tubes

Chase flattening test, index of Antimonial Admiralty tube's physical quality and ability to withstand bending or end flaring.



This Chase metallurgist is checking the size and uniformity of grain of Chase Antimonial Admiralty heat exchanger tubes.

When you put Chase Antimonial Admiralty* tubes into a heat exchanger you *know* they'll stand up for years. It isn't only that we make certain there's enough antimony to resist dezincification. Chase heat exchanger tubes are carefully tested and retested for *every* physical and chemical property required to meet actual field conditions. It pays to insist on Chase Antimonial Admiralty.

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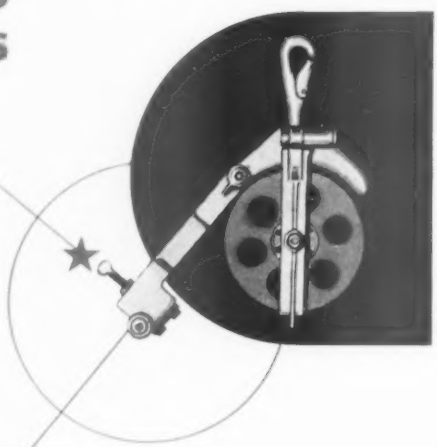
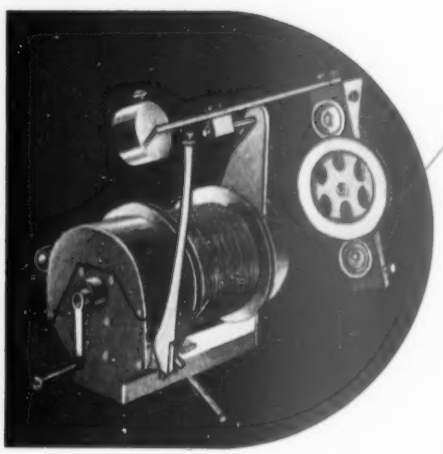
with HALLIBURTON'S MEASURING DEVICES



It might seem like a minor item, keeping a measuring line free of mud cake. But not to Halliburton engineers. They know, for example, that a decrease in sheave groove diameter or increase in line diameter of only .01" can cause a measuring error of up to 3.25 feet in a 10,000 foot hole.

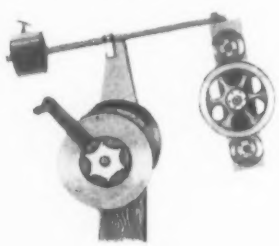
That's why they installed a latch-type Hay Pulley and special wiper on Halliburton's Measuring Line: to keep the line in the sheave, and to clean the line of mud cake. To provide the operator with greater accuracy.

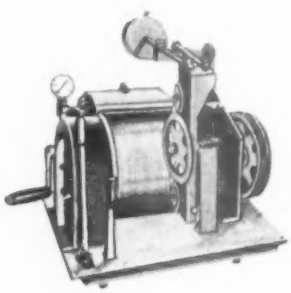
It is a little thing, but just one of the several reasons why Halliburton's Measuring Devices have set the standard for over 25 years; and why operators throughout the world continue to rely on them with increased confidence.



Halliburton's Measuring Devices now are regarded as an essential part of drilling equipment for: (1) accurate measurement regardless of well depth; (2) running crooked hole survey instruments; (3) running instruments to obtain bottom hole pressure and temperature; (4) running mechanically-operated paraffin cutting tools; (5) off shore surveying, and (6) running bridge plugs, squeeze packers, and other tools in casing or open hole.

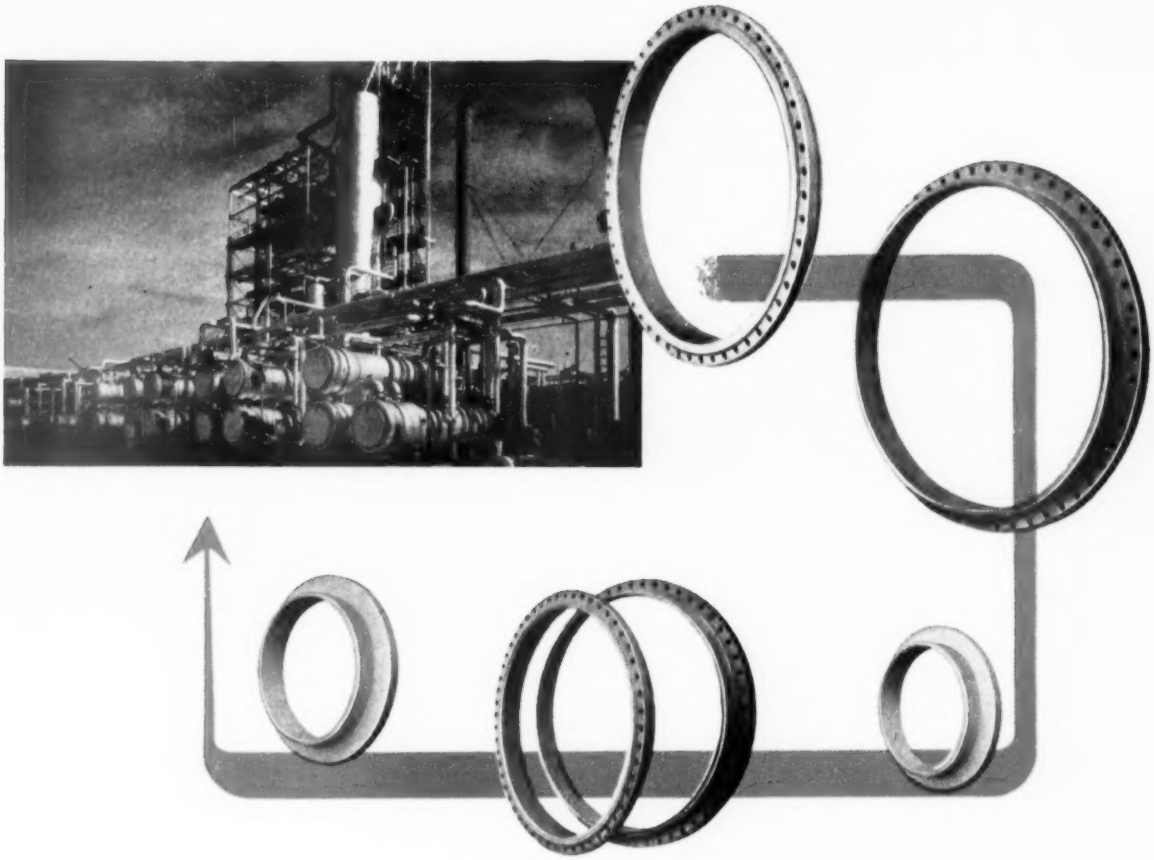
Call on these devices – backed by million job experience – to get *most accurate* well depth measurements. Just phone your nearby Halliburton representative.
Or contact Halliburton Oil Well Cementing Company, Duncan, Oklahoma.





YEARS AHEAD IN MEASURING DEVICES!

HALLIBURTON



there's a **Railway Steel Flange**

for your application!

Railway Steel flanges are made from carbon and alloy steels for just about every job in the petroleum, chemical, petrochemical, and gas industries where large-diameter flanges are required . . . all the regular standard types of flanges, as well as special types, including those built to TEMA standards. Railway Steel flanges are available in a wide range of sizes and types from 18 in. ID to 150 in. OD.

Our own high quality carbon and alloy steels are used in the production of Railway Steel flanges. Every step in fabrication from the production of the steel through forging, rolling, heat treating and machining is under rigid control to assure you flanges that will give maximum protection to your products and processes.

Sales representatives in Chicago, Cleveland, Houston, New York, Richmond, San Francisco, St. Louis, St. Paul and Tulsa* will be glad to provide complete information about these superior flanges for your applications.

**Ardun Supply Company*

Brake rims, gear blanks and other circular forgings are also available for many types of service. Use of our own steel assures complete dependability and long service life.

Railway Steel Flanges

RAILWAY STEEL-SPRING DIVISION

AMERICAN LOCOMOTIVE COMPANY

HOW'S THIS FOR OS&D HOSE PERFORMANCE?

Tanker loading conditions are particularly severe at the Union Oil Company's Port San Luis Wharf, Avila, California. When heavy seas are running, tankers must be held some 75' to 100' away from the dock with the aid of four heavy mooring buoys plus the ship's anchor. In spite of these conditions, Hewitt-Robins Smooth Bore Oil Suction & Discharge Hose performs with maximum efficiency.

Normal life expectancy for loading hose at this installation is 15,000,000 barrels, yet a single line of Hewitt-Robins Smooth Bore OS&D Hose has handled over 37,000,000 barrels to date. Here again, a customer's performance record has shown that for longer hose life and more economy in operation the first and best choice is Hewitt-Robins Hose.

For immediate information regarding Hewitt-Robins OS&D Hose or any Hewitt-Robins industrial hose contact your local Hewitt Rubber Distributor (See "Rubber Products" Classified Phone Book.)

HEWITT HR ROBINS

Executive Offices, Stamford, Connecticut

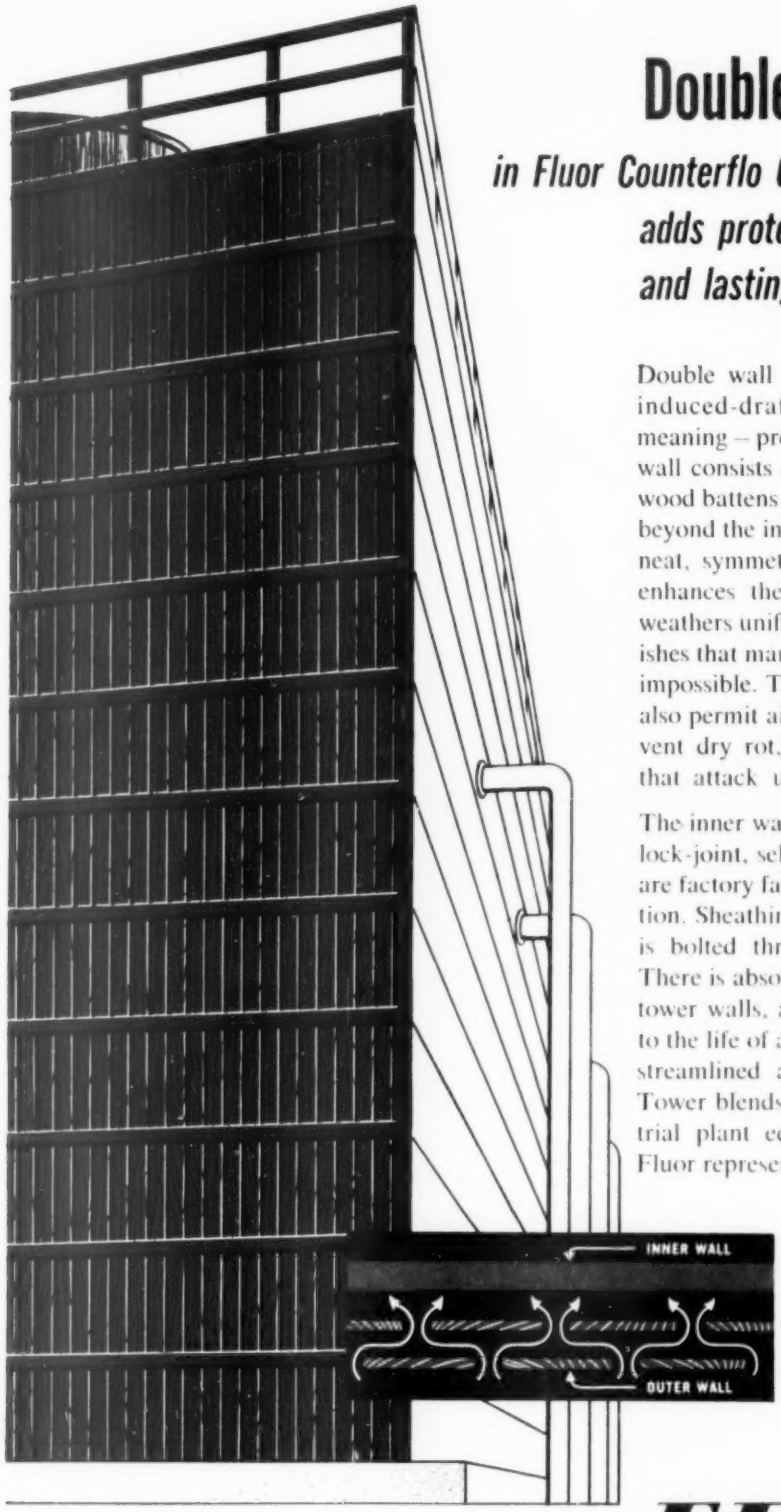
DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • EXPORT DEPARTMENT, New York City

Double wall sheathing

in Fluor Counterflo Cooling Towers adds protection and lasting good looks

Double wall construction provided on Fluor induced-draft cooling towers has a double meaning – protection and beauty. The outer wall consists of a double row of vertical Redwood battens which are located four inches out beyond the inner wall. This protective casing is neat, symmetrical, eye appealing and greatly enhances the beauty of a cooling tower. It weathers uniformly. Unsightly stains and blemishes that mar a cooling tower's appearance are impossible. The equally spaced rows of battens also permit air circulation around walls to prevent dry rot, algae growth and other blights that attack unventilated cooling tower walls.

The inner wall is constructed from 1 x 6 full Z lock-joint, select "heart" Redwood. Both walls are factory fabricated into panels for easy erection. Sheathing is not nailed to outer posts but is bolted through the main tower columns. There is absolutely no structural load borne by tower walls, another factor which adds length to the life of a Fluor Cooling Tower. The neat, streamlined appearance of a Fluor Cooling Tower blends well with today's modern industrial plant equipment. Contact your nearest Fluor representative, or write for details.



Top view of double wall. The uniform spacing of vertical battens is not for the sake of appearance alone. Air is permitted to circulate between the aerators to prevent dry rot and living organisms from attacking tower walls.

BE SURE WITH **FLUOR**

THE FLUOR CORPORATION, LTD.
LOS ANGELES 22, CALIFORNIA

FOREIGN FACTS—FLUOR: PARIS
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Showing method of packaging Bethlehem Sucker Rods. This unit package prevents rods from kinking or bending during shipment and handling, keeps them in good condition until ready for use.

Unit Package Protects Rods from Damage During Shipment

When you order Bethlehem Sucker Rods, you can be sure they will reach your yard in good condition, ready to go to work.

Bethlehem Sucker Rods arrive in good shape because they are shipped in a specially designed unit package, containing from 80 to 100 rods, making it possible to handle the rods by means of a crane and lifting rig. The unit package is made up of grooved steel spacers. The rods fit snugly in the grooves, and are kept from bending or kinking, or making contact with other rods, thus preventing defects which could lead to premature rod breaks.

In transit, the package is held tightly by bolts which clamp top and bottom wooden binders. The package is loaded on heavy blocks. Tie-rods and bracing make the load a single, solid unit.

Bethlehem rods shipped in this special unit package are made in four types, covering virtually every pumping condition. We also turn out a full line of sucker rod accessories. For complete details, call the nearest Bethlehem office or sucker rod distributor, or get in touch with us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

BETHLEHEM STEEL

BETHLEHEM *Sucker Rods*

UNIT RIG'S "Family" is GROWING!

UNIT RIG MODEL U-34
1,500 - 4,500 ft. drilling, with 4½" pipe.

UNIT RIG MODEL U-35
2,500 - 5,500 ft. drilling, with 4½" pipe.

UNIT RIG MODEL U-15
3,000 - 7,500 ft. drilling, with 4½" pipe.

UNIT RIG MODEL U-20
7,000 - 12,000 ft. drilling, with 4½" pipe.

UNIT RIG MODEL U-30
10,000 - 16,000 ft. drilling, with 4½" pipe.

With the introduction of the new Model U-35, UNIT RIG adds another member to its growing "family" of draw works. NOW, models are available to drill from 1,500 to 16,000 feet. Every model is designed to give the same economy and efficiency of operation that made UNIT RIG'S U-15 and U-34 leaders throughout the oil fields. Write for complete information on the model that matches your needs.

UNIT RIG
-&-
EQUIPMENT CO.
TULSA, OKLAHOMA U.S.A.

DESIGNED FOR THE JOB . . .

UR-525

UNIT RIG DRAWWORKS ARE SOLD EXCLUSIVELY THROUGH THESE AUTHORIZED DISTRIBUTORS IN THE U.S.A. AND CANADA

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Iverson Supply Company
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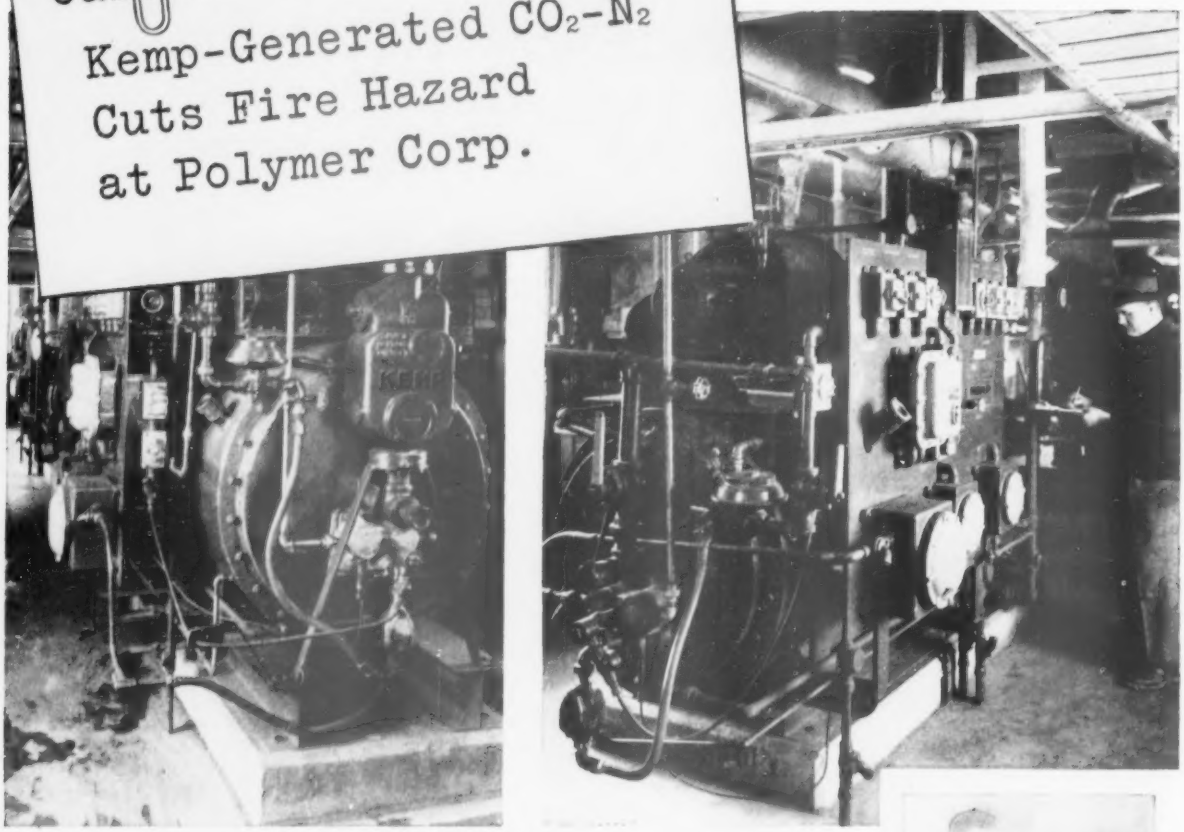
Jones & Laughlin Steel Corp., Supply Div.
Norvell-Wilder Supply Company
Howard Supply Company
Lucey Products Corporation
Oil Well Supply Division, United States Steel Corp.

Export Sales—Mid-Continent Supply Company, 42 Broadway, New York City. Cable—Midunitrig

Case No. 62

Kemp-Generated CO_2-N_2 Cuts Fire Hazard at Polymer Corp.



How Polymer operated day and night for 10 years at maximum safety

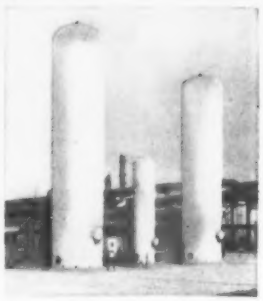
When Polymer Corporation, Ltd., Sarnia, Ontario, began operations in 1943, inventory included two Kemp MIHE Inert Gas Generators. Since that date, Polymer—and its Kemp equipment—has been operating 24 hours a day, 365 days a year. The huge quantities of man-made rubber and associated chemicals it produces—200,000,000 pounds during one year alone—reach, in one form or another, the four corners of the world.

Kemp Plays an important Role

The high volatility of many of the ingredients used in this giant operation necessitates blanketing and purging vessels after use. It is in this step that Polymer employs Kemp Generators to assure safe, trouble-free performance. The gas they produce is piped to different operations over the entire company area—it *must* be clean! Kemp does the job—Polymer knows that it can depend on Kemp to deliver a *clean inert at a specific analysis, regardless of demand*. And every Kemp Generator is engineered for fast starts and easy operations that save *time* and *money*.

Kemp Can Do a Job for You

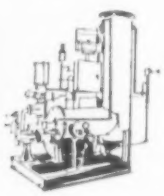
Kemp superiority is no accident. It is based on years of experience . . . on quality of design to meet specific problems. Every Kemp design features the Kemp Industrial Carburetor for complete combustion without tinkering or waste . . . for simplified installation and maintenance. Every Kemp design includes the latest fire checks and safety devices. If you have a blanketing or purging problem, contact Kemp engineers. They will be glad to study your situation and recommend the installation best suited to your needs. No obligation, of course.



Gas generator building from which inert gas is piped over 130 acres of company property at Polymer's Sarnia, Ontario, operation.

For more complete facts and technical information, write for Bulletin I-10 to: **THE C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.**

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS
SINGEING EQUIPMENT

We're always glad to lend you a helping hand

This picture shows the Hindu triad performing the Dance of the Universe. The many different arms symbolize its many different powers—and remind us that Ethyl Corporation seems to have developed a few extra arms, too.

In thirty years of working with the petroleum industry, we have built up a powerful advertising arm, which was one of the decisive factors in stimulating public demand for premium gasoline, and is today helping you increase sales of this extra quality product. And we've backed up this arm with another which fashions movies, booklets, demonstrations, and other selling aids to help your service station people increase premium sales.

Then there's the Ethyl research arm which helps you squeeze the highest

(*Continued on next page*)

Printed in U. S. A.

We're always glad to lend you a helping hand

(Continued from preceding page)

possible octane number out of every ounce of TEL. And a gasoline testing arm which helps you measure and maintain the quality of your gasoline.

Our farm-program arm helped to develop an entirely new market for gasoline, and continually works to increase the size of this market.

Our statistical arm tabulates and delivers exclusive information on gasoline sales to help you analyze your own regular and premium sales.

And finally, Ethyl's automotive arm works constantly with manufacturers of auto, truck and bus engines to help them develop engines that will make more efficient use of your gasoline.

In short, we believe Ethyl is uniquely equipped to lend you a helping hand —and we're always happy to do so.

ETHYL CORPORATION

NEW YORK 17, NEW YORK

Ethyl service is backed by 30 years of antiknock experience

RESEARCH

SALES HELPS

SUPPLY SERVICE

ROAD TESTING

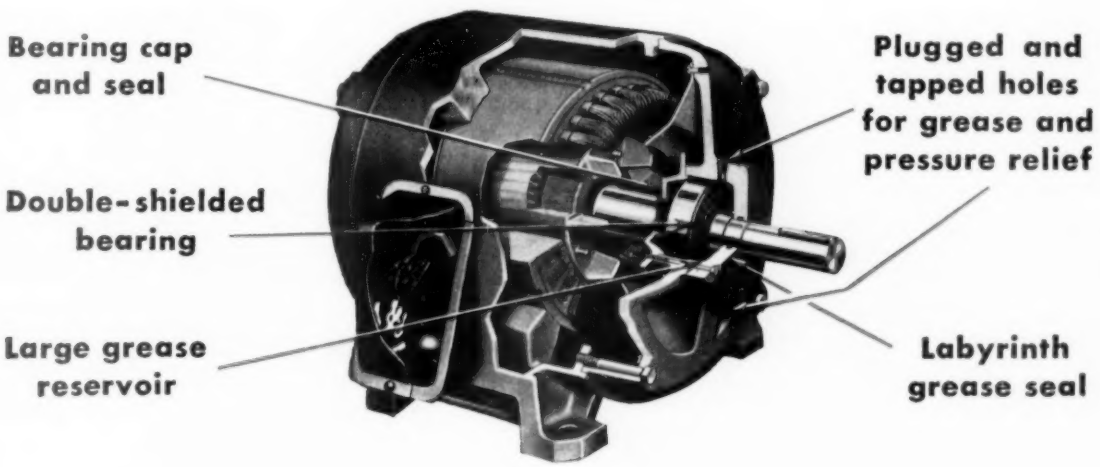
TECHNICAL REPORTS

GASOLINE TESTING

Here Are Facts You Should Know About Electric Motor Bearings

An ideal motor bearing would operate for indefinitely long periods under all types of conditions without requiring any attention whatever. However, in the opinion of our engineers, such a bearing and its attendant lubricant are not yet available on the commercial market. Consequently, bearings for many types of operations, particularly where overloading, extreme temperature ranges and chemical and dirt laden atmospheres are involved, require special lubricants or regular lubrication schedules.

Of course, bearings suitable for many kinds of operation under normal conditions can be built to require no attention for very long periods — usually several years. Allis-Chalmers can supply sealed bearings in all frame sizes through 505 on short delivery and without extra cost for applications of this type.


Bearing cap and seal
Double-shielded bearing
Large grease reservoir
Plugged and tapped holes for grease and pressure relief
Labyrinth grease seal

Which is the Best Design for *Your* Application?

But, we believe that the design used in standard Allis-Chalmers drip-proof, tefc and explosion-proof motors represents the best design for most industrial users.

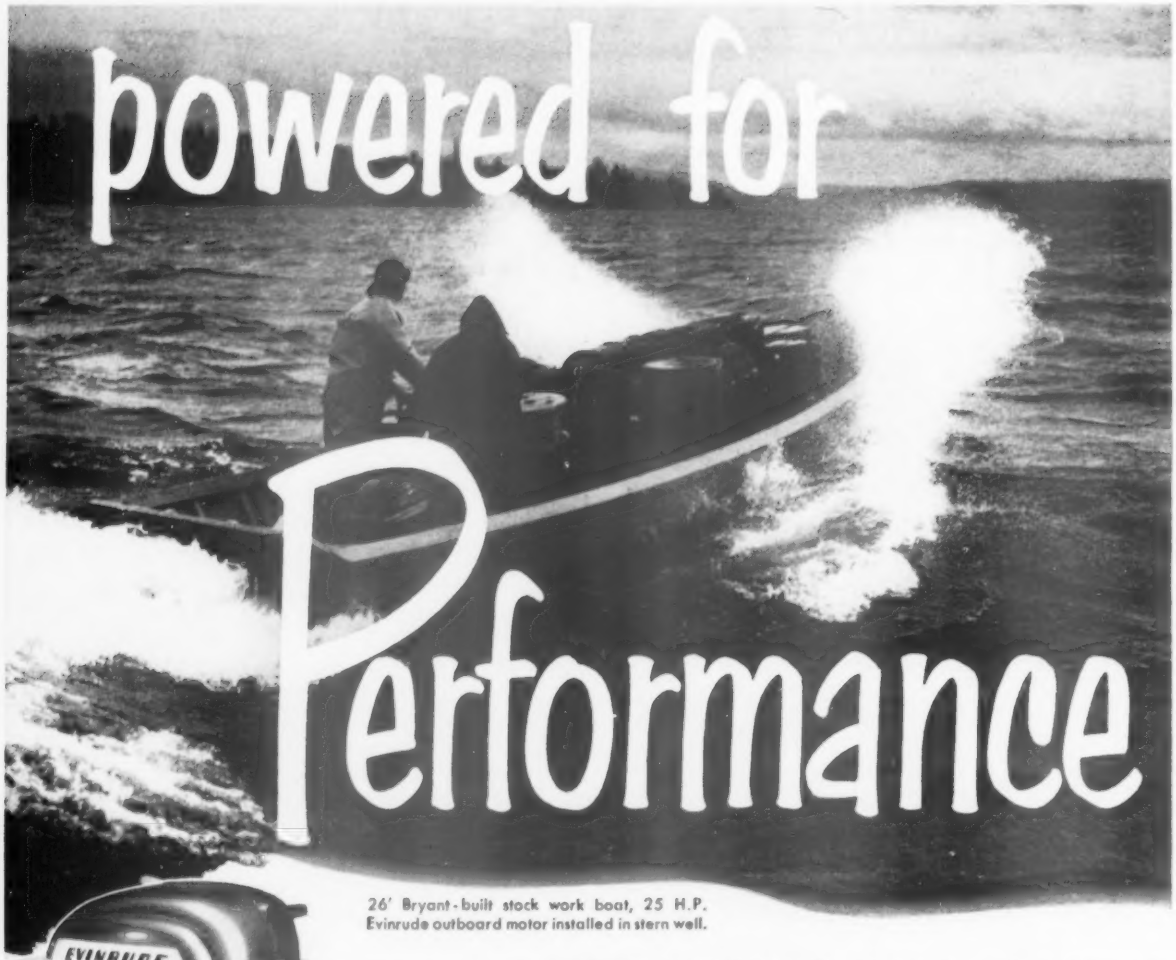
The Allis-Chalmers standard design consists of a pre-lubricated, double-shielded bearing mounted in the end housing with a generous grease reservoir. Plugged and tapped holes are provided for grease and for pressure relief. Under normal operating conditions, this design will operate as long without attention as any other type of bearing in use today. But where difficult operating conditions make re-lubrication desirable, it can be done as part of the normal lubricating-routine without dismantling the motor.

The large grease reservoir and shielded bearing design assure that grease lost from the bearing due to high operating temperatures or other causes will be replaced automatically.

For further information on bearing design and other features of Allis-Chalmers motors, call your nearby Allis-Chalmers District Office or Authorized Distributor. A-4133

ALLIS-CHALMERS

powered for Performance



26' Bryant-built stock work boat, 25 H.P. Evinrude outboard motor installed in stern well.

BIG TWIN

25 O.B.C. certified B.H.P. at 4,000 R.P.M. Gearshift, separate plug-in fuel tank. Prices, F.O.B. factory, subject to change without notice.

$390

PROVED PERFORMANCE! No "maybe" when it came to picking the power plant for this husky work boat. In identical hulls the Evinrude 25 H.P. Big Twin had conclusively proved its advantages over conventional engine installations of the same rated horsepower. Higher speed, light or loaded. Greater maneuverability. Important space saving. Easy beaching. *Far lower cost*—as much as $900 *less* than the conventional installations.

With *performance,* an Evinrude gives you stamina and low upkeep you couldn't beat in any type of motor. A complete line, 3 to 25 H.P., to meet the widest range of work boat needs. See your Evinrude dealer—look for his name under "Outboard Motors" in the yellow pages of your phone book. For complete literature write EVINRUDE MOTORS, 4199 North 27th Street, Milwaukee 16, Wisconsin.

In Canada: Manufactured by Evinrude Motors, Peterborough, Ontario

Big Twin is also available in 20" extra depth model suitable for transom heights to 35". Photo shows Bristol Bay, Alaska, sailing gillnetters converted to power with this motor.

EVINRUDE

OUTBOARD MOTORS

Progresssive pipe liners specify E-I-M valve controls

All Over The World

E-I-M VALVE CONTROLS

Are The Guardians Of The Oil And Gas Industry's Life Lines.

E-I-M's air-operated Type A valve control is used in remote areas where other power is unavailable, and it is often used in hazardous areas.

E-I-M Company INCORPORATED

1340 OLD SPANISH TRAIL • HOUSTON 21, TEXAS • MOhawk 4587

Valve Controls • Speed Reducers • Cooling Tower Drives • Control Valves

DOWELL INCORPORATED DISTRICT ENGINEERS ARE ON THE JOB SITE IN SECONDS WITH...

Both the scope of Dowell Incorporated oil-well servicing operations and its reputation in the industry today are the result of careful planning to affect job economies yet improve the efficiency of every function. In this program they quickly recognized a need to coordinate all activities via radio communication. For equipment that would provide years of dependable service . . . would fit the pattern of their flexible field set-up and require minimum maintenance . . . they logically selected General Electric.

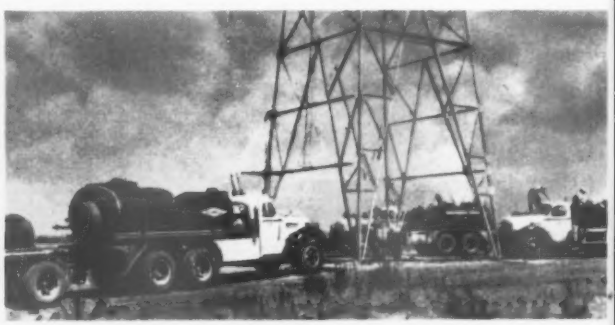
Using G-E 2-way radio, field men can now focus the complete engineering know-how of any district office on a difficult assignment. Economical and accurate decisions are relayed in seconds! And, G-E units throughout the system not only eliminate headquarters trips but are used to re-locate a field service group for emergency or new jobs. This time saving has permitted Dowell to expand operations greatly without increasing the number of trucks, cars, and engineers normally required.

Remember, when radio will solve one or a hundred problems for you . . . G-E will do it best! Call the CAS* man at a local G-E office or write for additional information. *General Electric Co., Section 883-10, Electronics Park, Syracuse, N. Y.*

**Communications Advisory Service*

TYPICAL BASE STATION consists of a 250-watt transmitter and receiving set with tower and accessories. Car and station units are identical for the entire system.

FIELD ENGINEERS consult with district offices and stations constantly—confirm data for job-site decisions—order supplies—discuss problems—report progress.



DOWELL EQUIPMENT ON THE JOB is utilized to the fullest extent. District office and station dispatchers control arrival and departure for radically improved customer service.

GENERAL ELECTRIC 2-WAY RADIO CONTACT WITH OTHER FIELD UNITS cuts service time, affords closer teamwork and provides safety control when hazardous conditions exist.

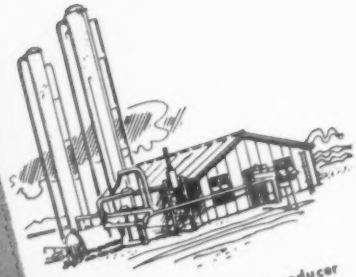
G-E 2-WAY RADIO

DOWELL INCORPORATED MAP OF G-E RADIO NETWORKS. Black dots show base stations connecting districts. Single circles indicate current construction . . . double circles pinpoint proposed station locations. To date Dowell Incorporated has 39 base stations and 250 mobile units . . . all General Electric equipped!

You can put your confidence in—

1876 75 1951
YEARS OF ELECTRICAL PROGRESS

GENERAL ELECTRIC



The Cleveland CU speed reducer shown at work here is part of the closely controlled cooling system on 3 gas-driven compressors in a prominent plant in Texas. Thousands of these compact, heavy-duty vertical Clevelands are at work in the oil and gas country in applications where the need for positive control of cooling is essential.

Controlled cooling with CLEVELAND CU vertical drive

THIS Cleveland cooling tower unit is at work in a Texas gas treating plant. It drives a fan at proper predetermined speed to deliver the volume of air necessary to cool compressor jacket water. There is never any unwanted fluctuation in fan speed to disturb temperature control.

The Cleveland CU worm gear speed reducer is specifically designed to meet the special conditions in cooling tower service: Large diameter shaft, tapered roller bearings on fan shaft which carry heavy thrust and radial loads, heavy externally ribbed housing which rigidly maintains gear alignment, case-hardened steel worm meshing with a long-wearing, specially constructed bronze gear. All these features, backed by 41 years of specialization on worm-gear engineering, make Cleveland drives an economical and dependable investment.

If it's controlled cooling you want, get the drive that's built to give it—the Cleveland CU. Write today for new Catalog 400. The Cleveland Worm and Gear Company, 3286 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

MOST TALKED-ABOUT TRUCK ON THE ROAD

The Autocar V/8

The first Autocar V/8s were delivered to a few customers only a year ago. Now, 12 months later, they're the talk of the industry and, judging by the flood of inquiries and orders, almost everybody wants them. The news has spread by word of mouth. One owner, for example, is making four inter-city trips instead of three. A number of drivers of other vehicles have discussed the V/8 after seeing it pull away from them on hills. All in all, it is recognized that Autocar has something very unusual in its precedent-shattering V/8. Add to this the fact that the Autocar V/8 is equipped with the Autocar Driver Cab—the most imitated cab in the industry. No wonder both operators and drivers want to find out if it's as good as they hear it is. We tell you more about it—*all* about it—in the Autocar V/8 booklet. To get your copy, just fill in and mail the coupon.

AUTOCAR TRUCKS

THE AUTOCAR COMPANY • ARDMORE, PA.

Established 1897

Factory Branches and Distributors from Coast to Coast in the U.S. and Canada

Export Division: Drexel Building, Philadelphia 6, Pa., U.S.A.

The Autocar Company, Ardmore, Pa.

Please send me the Autocar V/8 booklet.

Name_____

Company Name_____

Address_____

Number of trucks in fleet_____

Type of operation_____

19H

"I'll call METAL GOODS— they're our best bet!"

Most Completely Rounded Warehouse Stocks

More and more users of metals are discovering Metal Goods Corporation's large and varied warehouse stocks the "best bet" for *all* their metal needs. Metal Goods carries a heavy inventory in aluminum, stainless steel, steel, nickel*, monel* and inconel*, brass, copper, and industrial products. We invite you to give your company the full benefit and big convenience of this *one-call buying* advantage. You can rely on us to supply your requirements correctly, completely and quickly. May we serve you?

*Not sold in St. Louis or Kansas City

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Phone: 4-7536, 4-7537

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FOrtune 5326

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Roy D. Bagaley
Phone: 4-0366

Memphis, Tennessee
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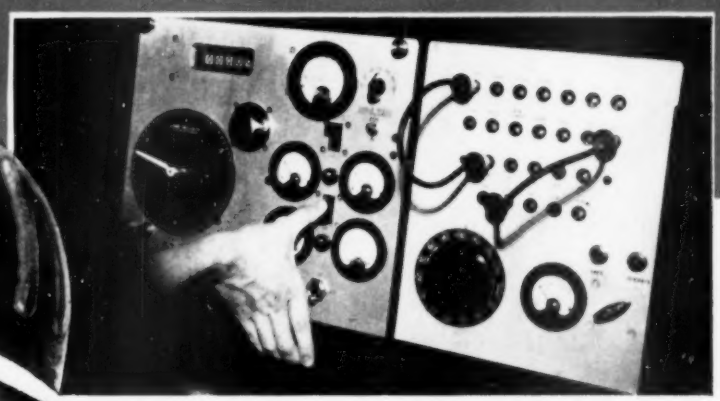
Robert W. Downs
Phone: 5-8721

"We play these guns like a pipe organ... not a rubber stamp"



When the operator sits at this control panel on a Lane-Wells perforating job, he can "play the tune" the way *you* order it. Firing one shot at a time, he'll give you any perforating density your conditions call for—one shot in a hundred feet, one hundred shots in a single foot, or any possible variation or combination in between. That's what we mean by "Selective Perforating"—the job tailored to your needs, not rubber-stamped by a set pattern. That's why Lane-Wells gets the job done *right*—the *first* time! Ask *your* Lane-Wells man.

BETTER PERFORATING

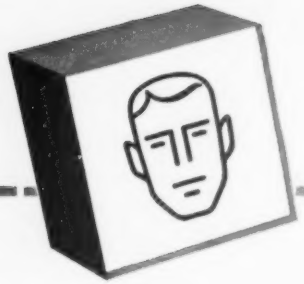
LANE WELLS COMPANY

Tomorrow's Tools—Today!

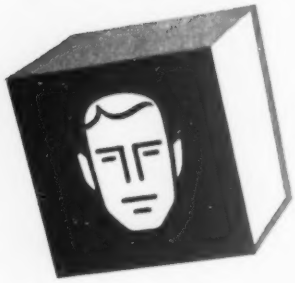
General Offices, Export Office, Plant • 5610 So. Soto St., Los Angeles 58

LOS ANGELES • HOUSTON • OKLAHOMA CITY • LANE-WELLS CANADIAN CO. IN CANADA • PETRO-TECH SERVICE CO. IN VENEZUELA

AG-609



Are you getting the most out of YOUR ALLOY STEELS?



REPUBLIC 3-DIMENSION METALLURGICAL SERVICE

can help you answer this Question

You may be getting all the qualities you expect from the alloy steels you use. But you may not be taking advantage of some important properties which could make your products even better. Or cheaper to produce.

The best way to find out is to call in Republic's Three-Dimension Metallurgical Service. Here's how it works. First, Republic Field Metallurgist looks over your products and your plant. His report goes to the Republic Mill and Lab Metallurgists. All three then pool their knowledge of alloy steels, heat-treatment, and fabrication.

The results: recommendations that often mean better products, higher production and lower costs. And there are scores of Republic customers who have had this pleasant experience.

Whether your product is well established . . . or you're planning a new one . . . it will profit you to take advantage of this complete and extensive consulting service for steel users. It's available through your local Republic Steel Sales Office.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

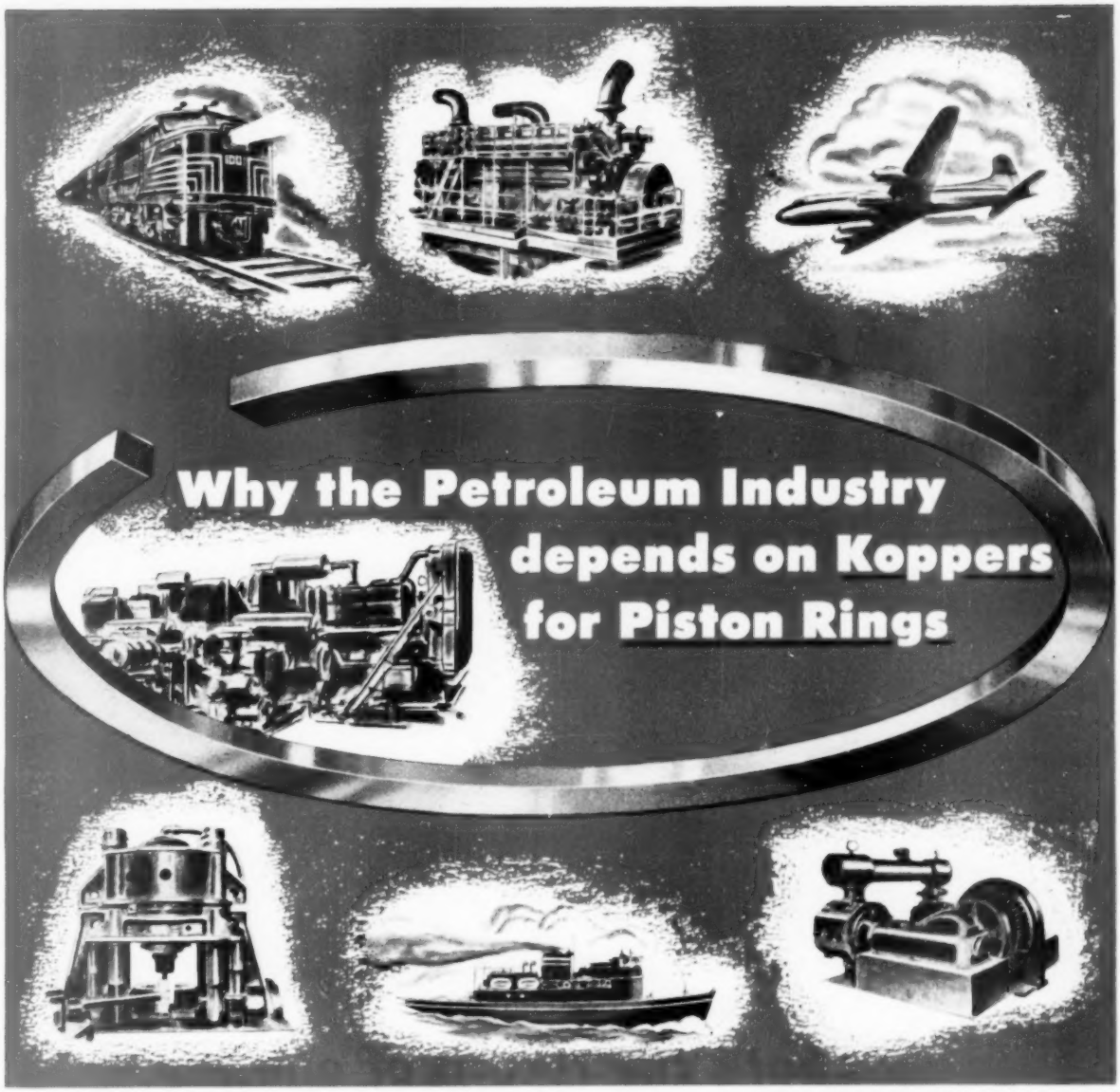
LAB FIELD MILL
3-DIMENSION Metallurgical Service

...combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

REPUBLIC STEEL

Republic ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing



Koppers manufactures piston rings in every size, of every type, for every industrial and aircraft purpose.

FROM all parts of the petroleum industry come reports of savings in time, labor and money through the use of Koppers Rings in pumps, compressors, diesel and gas engines and other equipment. That's because Koppers research and engineering keep up with modern advances in equipment design by constantly improving ring materials and manufacturing methods.

Koppers K-Iron® Rings are made of a high-grade, closely-controlled material that imparts improved wear properties and is surface treated chemically as an anti-scuffing aid. They are made in diameters to 120″ in a variety of joint types. Koppers Porous Chrome* Rings hold and distribute oil during break-in, quickly wear to best possible seating... *cut cylinder wear up to 50%, last 4 times as long as ordinary rings!*

Our engineers, who work with you in determining the best rings for your applications, have all the facilities of the large, modern Koppers piston ring plant at their disposal . . . to supply you with rings that cut down-time, increase efficiency and lengthen the life of your equipment.

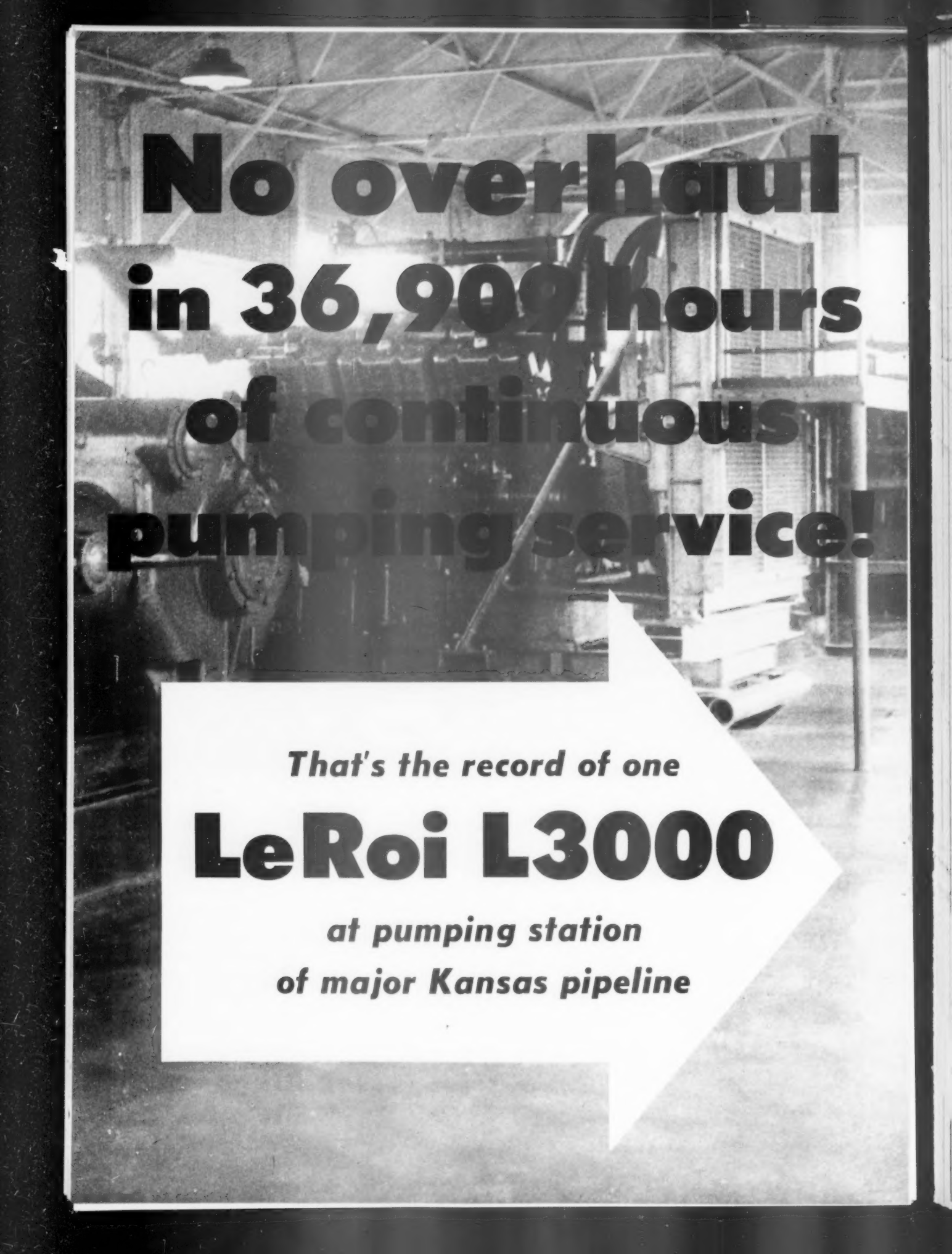
WRITE, wire or phone us today for experienced help with your piston ring problems. KOPPERS COMPANY, INC., *Piston Ring Dept.*, 1558 Hamburg St., Baltimore 3, Md.

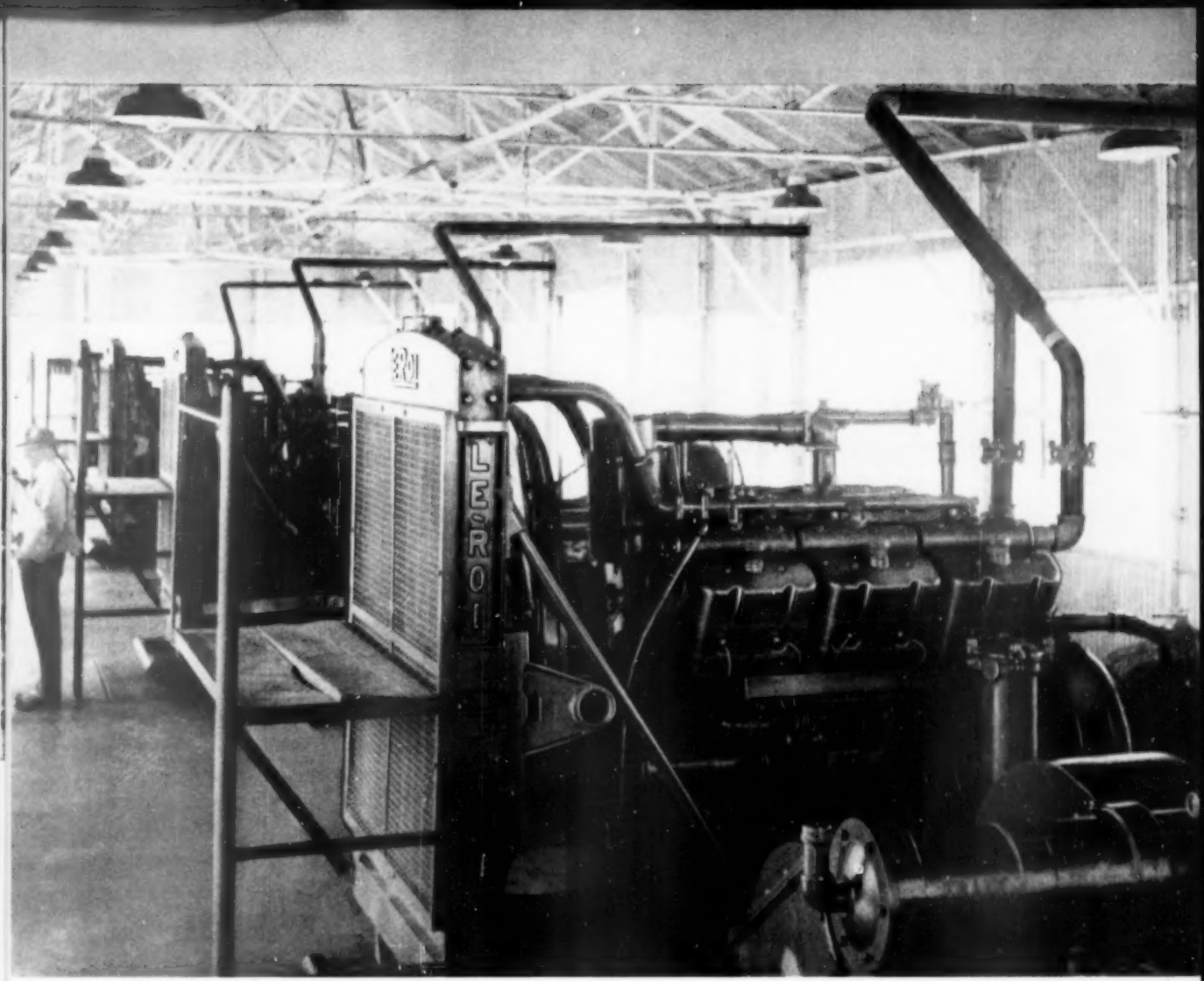
*Van der Horst Process

KOPPERS®

Koppers American Hammered Industrial Piston Rings

Only **KOPPERS** *can furnish K-Spun® and Porous Chrome!*


No overhaul
in 36,900 hours
of continuous
pumping service!
That's the record of one
LeRoi L3000
at pumping station
of major Kansas pipeline



The figures speak for themselves...

Le Roi leads in dependability! Le Roi leads in economy!

If you're interested in cutting your costs for pipeline pumping, here are figures you simply can't afford to ignore:

In the installation pictured above, one of the Le Roi L3000's operated continuously for more than 4 years — under an average load of about 200 hp — before needing overhauling! And then labor amounted to only $373 and parts to only $1578.

A second Le Roi L3000 at the same station operated continuously for 33,615 hours — under the same load — before it had to be overhauled! Labor for the overhaul cost only $476 and parts only $1305.

Now, these aren't isolated cases. In fact, another Le Roi L3000 installed at a different pumping station of this same pipeline company had over 39,500 hours' service and had never been overhauled!

Want to see profitable performance like that at first hand? Ask your supply house or Le Roi distributor to take you around to some Le Roi installations. Have them show you why more and more Le Roi's are being installed for pipeline and other oil-field service.

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland • Greenwich, Ohio

Oil Field Headquarters: Tulsa Oklahoma

Service as Near as Your Telephone

Complete parts stocks . . .
Skilled mechanics on 24-hour call
. . . Unexcelled overhaul facilities

Oilfield Sales-Service Network

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Le Roi Company Branch — Tulsa
Carson Machine & Supply Co.—Oklahoma City

East & South Texas, Gulf Coast
Southern Engine and Pump Company—Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, Louisiana.

North & West Texas, New Mexico
General Machine & Supply Co. — Odessa, Snyder, Texas.
Nortex Engine & Equipment Co. — Wichita Falls, Texas.

Kansas
Carson Machine and Supply Co. — Great Bend

Illinois — Western Kentucky
Western Machinery & Engine Company — Centralia, Illinois and St. Louis, Missouri.

Michigan
Hofer Engine Service — Reed City

Rocky Mountain Area
Gehring Equipment Co. — Casper, Wyoming, Rangeley, Col.

Mississippi, Arkansas & Northern Louisiana
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West Coast
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Appalachian Area
P. C. McKenzie Co., Pittsburgh, Bradford.

Canada
Lucey Export Ltd.—Calgary, Edmonton, Alberta.

P-121

Republic's

CHAMPION

Rotary Hose

The nipple assembly is patented. The higher the pressure, the tighter the seal.

A tough, flexible hose, with built-in steel muscles.

Reprene throughout helps the hose defy oil, abrasion, distortion.

In service and safety CHAMPION offers what you want in rotary hose.

Ask at your J&L store what this hose is doing locally—what drillers think about it and why.

REPUBLIC RUBBER
DIVISION
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JONES & LAUGHLIN STEEL CORPORATION
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General Offices: TULSA, OKLAHOMA
88 STORES • 19 OFFICES • 9 RESIDENT SALESMEN
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WHY OPERATORS PREFER
SCHLUMBERGER!

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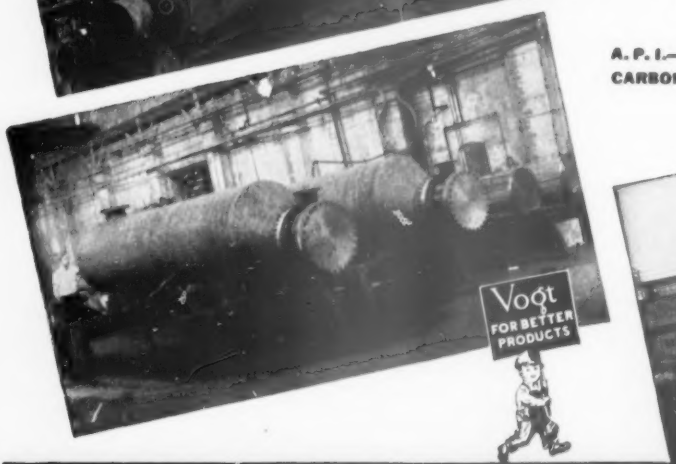
Vogt

WELDED PRESSURE VESSELS

Top quality power and process plant equipment for safe operation at high or low pressures and temperatures is produced here for leading Petroleum Refineries, Chemical Plants, and Power Plants the world around.

A growing preference for Vogt welded pressure vessels is due to skilled personnel, powerful X-ray apparatus to control weld quality and modern stress relieving furnaces, combined with complete laboratory facilities for tests of welds.

A. P. I.—A. S. M. E. and A. S. M. E. CODES
CARBON STEEL and ALLOY STEELS



HENRY VOGT MACHINE CO.
INCORPORATED
LOUISVILLE 10, KENTUCKY
BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS

BIG OUTPUT

...BUT LESS WORK FOR THE OPERATOR!

All the operating features needed for effective, high speed drilling are built into Bucyrus-Erie spudders. Simplified controls make them easy to run at top speed. With all operating levers conveniently grouped on one corner of the frame, only a short "reach distance" separates the driller from the job at all times. Check these four outstanding features of Bucyrus-Erie's simplified control system:

TWO FORWARD SPEEDS

— and one reverse for all drums and catheads (except 60-L, which has one forward and one reverse speed). Extra speed provides slow, high-power action for extra safe handling.

INTERCONNECTED LEVERS

— Two speed hoist (on all models except 60-L) is controlled by individual hand levers interconnected to change speed instantly without stopping. Shifting is done with only one hand.

CAM CONTROLLED SPEED

— To accelerate speed as needed, a sensitive positive cam is provided to adjust the engine throttle.

AUTOMATIC LINE FEED

— An adjustable latch bar on the bull reel brake lever allows automatic release of line as drill bit cuts deeper into the hole.

Easy operation is just one of many Bucyrus-Erie spudder advantages. Get full details from your nearby distributor. 9553

FOUR MODELS TO CHOOSE FROM

60-L · 28-L · 36-L · 48-L

Maximum drilling depth 6000 feet; servicing 7000 feet.

BUCYRUS ERIE

South Milwaukee
Wisconsin

FIRST with the FINEST in Spudders!

CUMMINS DIESELS

are engineered to make light work of tough jobs

***Leaders* in rugged, lightweight, high-speed diesel power!**

Progressive, eyes-ahead engineering is one of the big reasons why so many oil men pick Cummins Diesels for dependability.

Consider Cummins' exclusive system for fuel injection and metering —an important factor in the unequalled performance records established by lightweight, high-speed (60-660 h.p.) Cummins Diesels. No other Diesel fuel system is so simple . . . so rugged! It delivers a uniform, properly prepared fuel charge to every cylinder. All under low pressure—no chance of bursting and leaking fuel lines.

Your Cummins dealer will be glad to tell you more about the exclusive fuel system and other engineering advantages built into every Cummins Diesel. He is an expert who knows the requirements of your job. He heads up a specialized parts and service organization — equipped to handle all your diesel power needs. Call him today... or write!

CUMMINS ENGINE COMPANY, INC.,
Columbus, Indiana

CUMMINS

Export: Cummins Diesel Export Corporation, Columbus, Indiana, U.S.A. • Cable: CUMDIEX

in this little bag of beans

42

sizes of economical

UNIBOLT

- Christmas Tree Flow Manifolds
- Positive Chokes
- Cage Nipples
- Tees and Crosses
- Couplings and Blanking Plugs

FLOW-RATED X-BEAN INSERTS UNDER 14/64ths

total of 74 sizes of X-BEANS up to ½ inch!

UNIBOLT Flow Rated X-Beans, for use with UNIBOLT Choke Bodies and Cage Nipples exclusively, are drilled in increments of 5 percent and 10 percent of *well flow* rather than in increments of 1/64-inch. Consequently, the flow of fluid or gas can be positively controlled with a degree of accuracy never before attained. If, for example, a well produces 10 bbls. through a 1/64-inch choke, to increase the choke to the next largest fractionally drilled size, 2/64-inch, would increase the production to approximately 40 bbls. On the other hand, a well that produces 10 bbls. through a size X-35 UNIBOLT X-Bean would produce only 10½ bbls. through the next largest size X-Bean, X-35.5; 11 bbls. through an X-36, and so on.

This accurate control of production is a safeguard against the harmful effect of periodically pulling a well too hard in order to make its allowable.

THORNHILL-CRAVER COMPANY

P. O. BOX 1184 • HOUSTON, TEXAS

for primary and secondary recovery

by any method!

choose from National's complete line of Production Equipment

National Supply's continual development of production equipment, over the decades of service to the petroleum industry, has resulted in one of the most complete lines of recovery equipment in the oil country.

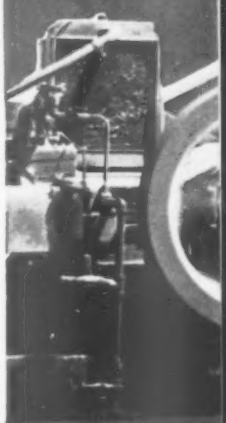
As an example, National Pumping Units are manufactured in 38 standard combinations, with API walking beam ratings from 3200 lbs. to 32,400 lbs. Available also are special long stroke pumping units designed for higher volume pumping in secondary recovery operations.

As an example, National's exclusive Plunger Lift, which utilizes natural reservoir gas pressure for more efficiently producing weak flowing wells and for low cost pumping in wells where paraffin deposits, emulsion, bottom hole water and scale accumulation hampers rod-pumping efficiency.

As an example, National's new F-90 Triplex Pump, specifically designed for water-flooding operations—yet ideally suited for salt-water disposal, high-pressure testing, gathering, formation fracturing, acidizing . . . or as power-oil source for subsurface hydraulic pumping systems.

As an example, National's top quality Sucker Rods, manufactured in three grades to meet all pumping conditions . . . and produced under the most exacting metallurgical and manufacturing standards in the industry.

Whatever methods of recovery operations you employ, be sure to get all of the profitable facts on the complete National Blue Line of production equipment. Product bulletins are available on request at your nearest National Supply Store.



THE NATIONAL SUPPLY COMPANY

PITTSBURGH 30, PENNSYLVANIA

Division Offices: Denver; Ft. Worth; Houston; Pittsburgh; Tulsa; Torrance

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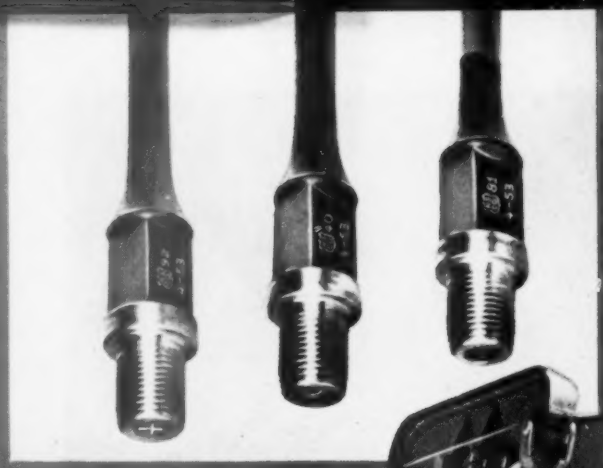
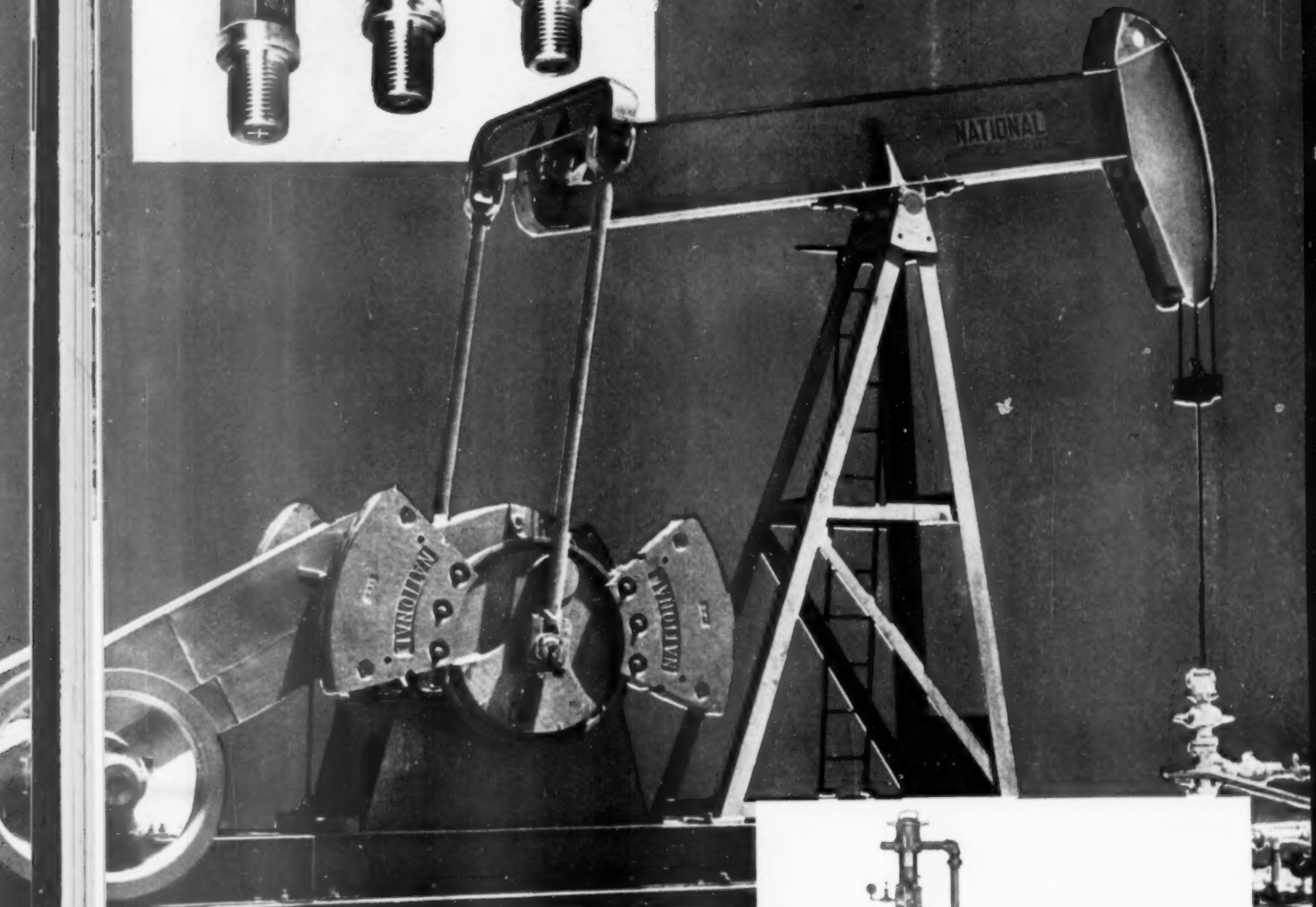
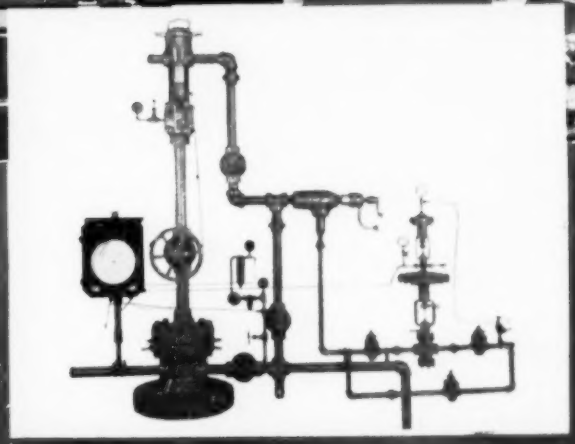
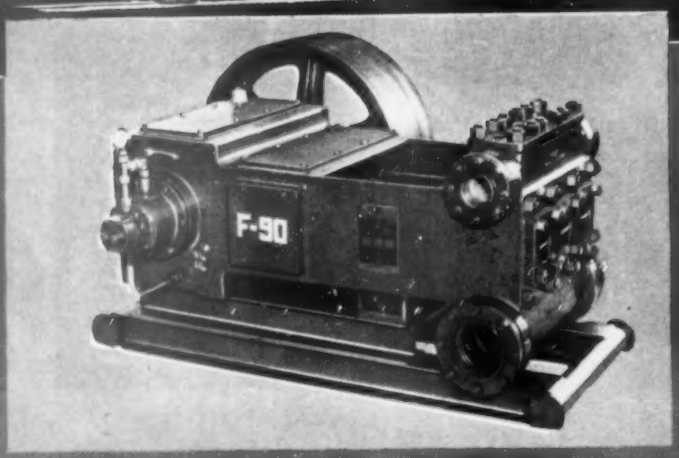
NATIONAL BLUE PRODUCTS

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT

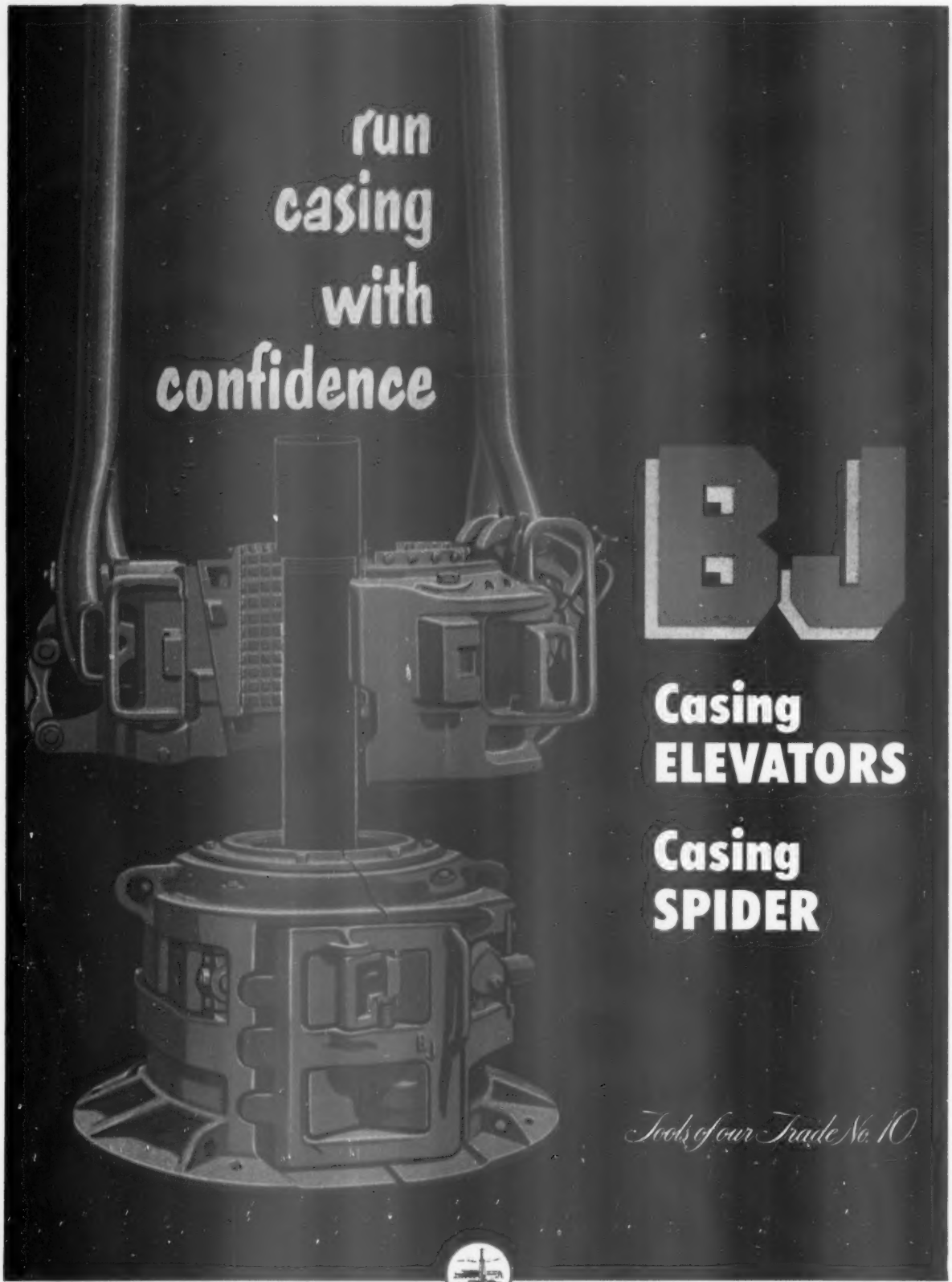








SPANG STEEL PIPE • SUPERIOR & ATLAS ENGINES



BJ MEANS ENGINEERED OIL TOOLS

BJ PB

Byron Jackson Co. Since 1872

LOS ANGELES NEW YORK FORT WORTH HOUSTON

This Size . . . . ➧

or This Size . . . . ➧

with all "kinds of sizes" in between

SKF's wide range of bearing types and sizes, plus helpful SKF engineering cooperation, makes it possible for you to select the bearing whose characteristics make it the best bearing choice for your particular application.

SELF-ALIGNING BALL BEARINGS

Compensate for angular misalignment resulting from faulty mounting, shaft deflection or distortion of the foundation. For radial loads and moderate thrust loads in either direction.

SPHERICAL ROLLER BEARINGS

Unexcelled for capacity. Inherently self-aligning. The full capacity of the bearing is always available for useful work. Will carry substantial thrust load in either direction.

DOUBLE-ROW DEEP GROOVE BALL BEARINGS

Embody the same design principle as the single-row type, but have lower axial displacement and substantial thrust capacity in either direction. Have very high radial capacity.

SINGLE-ROW DEEP GROOVE BALL BEARINGS

Sustain, in addition to radial load, substantial thrust load in either direction even at high speeds. Available with famous Fairprene Red Seals which keep dirt out and lubricant in. Also with any combination of Red Seals, shields, and snap-rings. Furnished in standard or precision tolerances.

ANGULAR CONTACT BALL BEARINGS

Support heavy thrust load in one direction, sometimes combined with moderate radial load. Can be mounted singly or in tandem for constant thrust load in one direction, also in pairs, face-to-face or back-to-back, for combined thrust and radial loads.

CYLINDRICAL ROLLER BEARINGS

Very high radial capacity and low friction which permits high-speed operation. Easy to dismount, even when both rings are mounted with a tight fit.

BALL THRUST BEARINGS

For pure thrust load in one direction only. Not self-aligning. The load line through the balls is parallel to the shaft axis, resulting in high thrust capacity and minimum axial deflection.

SPHERICAL ROLLER THRUST BEARINGS

For heavy thrust loads, or combined loads which are predominantly thrust, at high speeds on vertical or horizontal shafts. Fully self-aligning.

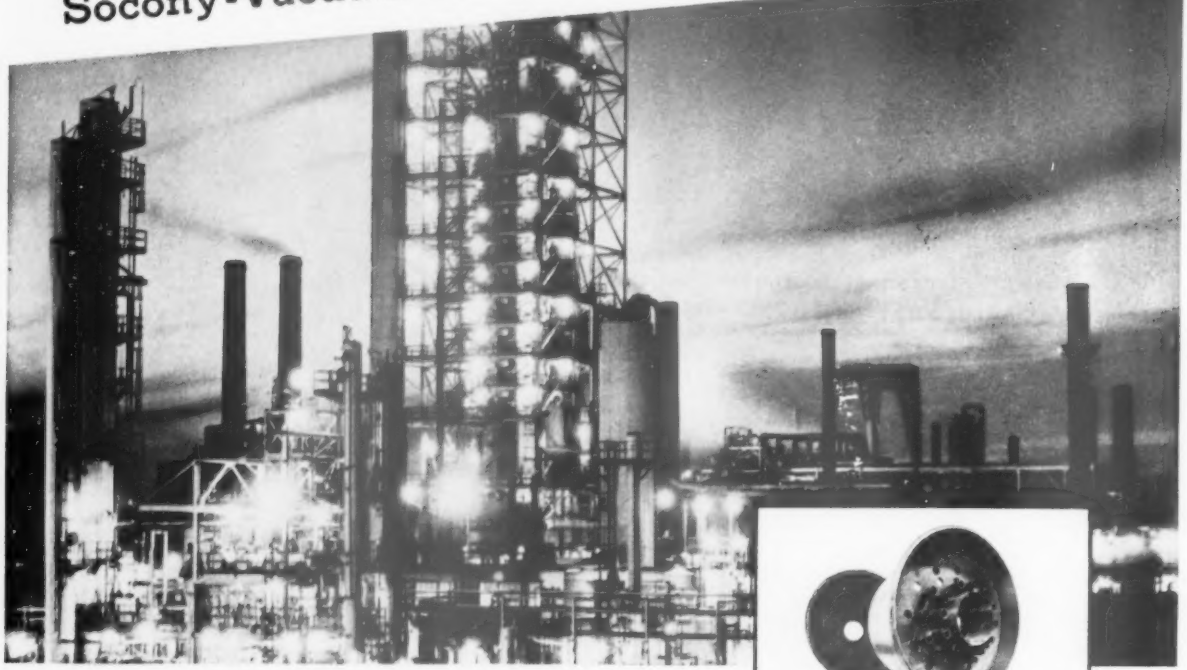
SKF®

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.
– manufacturers of **SKF** *and* HESS-BRIGHT *bearings.*

7308

Socony-Vacuum demanded PRECISION!



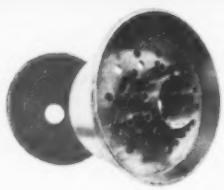
...and called on GRAVER

CRAFTSMANSHIP

For years Graver has been a leading producer of specialized fabrications for the petroleum industry. One of the reasons why can be seen in the various units Graver has built for Socony-Vacuum's Thermofor Catalytic Cracking installations. These installations incorporate their exclusive air-lift design for which Graver constructed the intricate fabrications pictured on the right.

These units are essential parts of a revolutionary design, the features of which Socony-Vacuum has recently adapted to small refineries, employing the same general principles.

Thus does Industry continue to depend on Graver for superior craftsmanship in steel plate fabrication.



Separator-surge hopper

Catalyst Feed Lines

Lift Pot

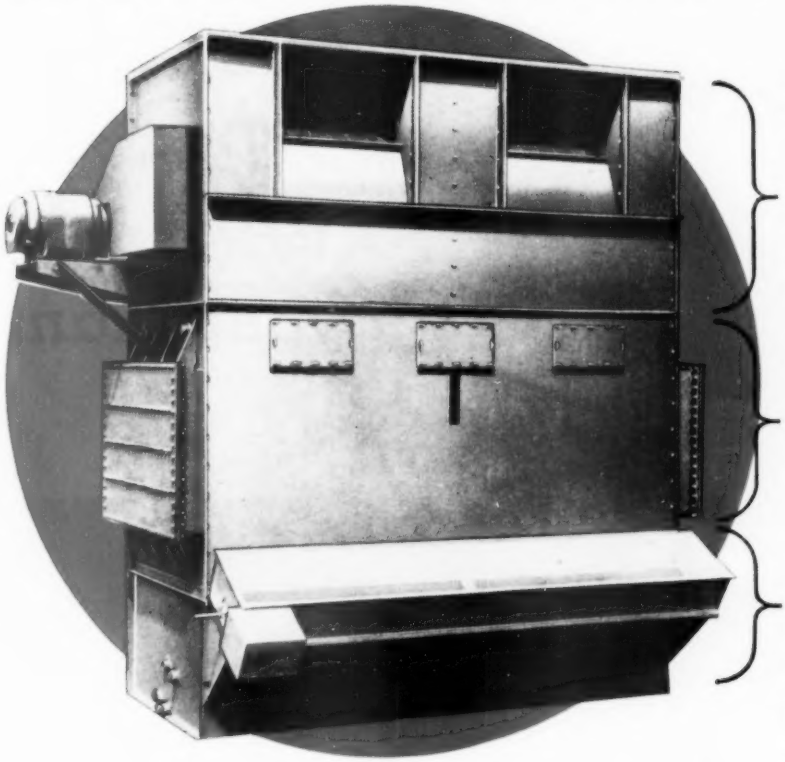
Primary Air Nozzle

GRAVER
PRECISION FABRICATIONS

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA

New York • Chicago • Philadelphia • Atlanta • Detroit
Cleveland • Pittsburgh • Houston • Catasauqua, Pa.
Sand Springs, Okla. • Odessa, Texas • Casper, Wyo.

Solve Big Cooling Problems with YOUNG EVAPORATIVE COOLERS



BLOWER SECTION

Built as a complete unit, this section consists of dynamically balanced multi-blade centrifugal blower, outlet scrolls for the blower housing, standard NEMA splash-proof motor, variable V-belt drive and air discharge duct. The blower fan is corrosion-resisting, double inlet design, dynamically balanced for long life, quiet operation.

COIL SECTION

Cooling coil section consists of straight, round, seamless tubes—copper, stainless steel or red brass—each rolled into header plates with baffles for multi-pass flow. Gasketed tank cover plates are used on coils for water and oil cooling. Tubes for cooling gases are rolled into steel tank headers with plugs opposite each tube for easy cleaning. Assembly also includes spray header, spray nozzles, moisture eliminators and inspection windows.

SUMP SECTION

The bottom, or sump section, consists of a water-tight, galvanized and rust-resistant reservoir for makeup and spray water, self-regulating float valve, and thermostatically controlled automatic shutters for the air inlet, air outlet, or both. The float valve automatically provides the volume of makeup water required to compensate for water losses due to evaporation and wastage.

Full length access door in sump tank for ease of service, and cleaning sump.

COOL— Jacket Water . . . Steam . . . Lube Oils . . . Natural Gas

For maximum heat transfer efficiency, select Young Evaporative Coolers to solve your big cooling problems. Versatile in design and completely self-contained, YEC units cool the liquid or gas in the coil by evaporation when water is sprayed over the coil assembly. Units are used primarily for cooling engine jacket water and lubricating oil (gas, gasoline, Diesel engines), steam, compressed air, natural gas or other fluids, and also for condensing steam, hydrocarbons, etc.

Designed and engineered to give long, efficient performance, Young Evaporative Coolers are built in six basic models, either with single or two coil assemblies. Normal operating pressures of 100 psig are used for water and oil cooling. However, for steam and natural gas cooling and condensing, pressures up to 2000 psig can be handled. Unit capacities range from 876,000 to 8,712,000 Btu's per hour.

CONDENSE— Hydrocarbons . . . Steam . . . Other Fluids

Coil assemblies for water, oil and gas service consist of straight, round, seamless copper, stainless steel or red brass tubes, each rolled into thick header plates at each tank with multipass baffles. Oil cooling units use chain-type agitator strips inside the tubes to increase heat transfer. Straight Admiralty tubes in the Gas Cooler coil assembly are rolled into steel tanks with a plug opposite the end of each tube for easy cleaning. For special cooling jobs, call on a Young Representative, or write direct.

YOUNG

Young Quality

GET THIS NEW CATALOG!

Illustrated Catalog No. 1952 gives specifications, dimensions, capacities and features of YEC units.

YOUNG . . . AN "OLD" NAME IN HEAT TRANSFER ENGINEERING

YOUNG RADIATOR COMPANY

Dept. 203-H • Racine, Wisconsin • Factories at Racine, Wisconsin and Mattoon, Illinois
OIL FIELD REPRESENTATIVES: J. R. MEEK COMPANY, 1341 S. Boston St., Rm. 109, Tulsa
FLOURNOY & EVERETT, INC., 5045 Santa Fe Ave., Los Angeles • HAROLD J. YOUNG, 206 Montgomery Bldg., Muskegon • JONES & LAUGHLIN STEEL CORP., Supply Div., 106 Main St., Bradford Penn.; Union Commerce Bldg., Cleveland; 401 Liberty St., Gateway Center, Pittsburgh; Clarksburg, West Virginia.

Other Representatives In Principal Cities

put this WASTE-HEAT SAVER in your plant

Are you now cooling hot gas oil, cracking coil tar, hot gases or other hot fluids with water?

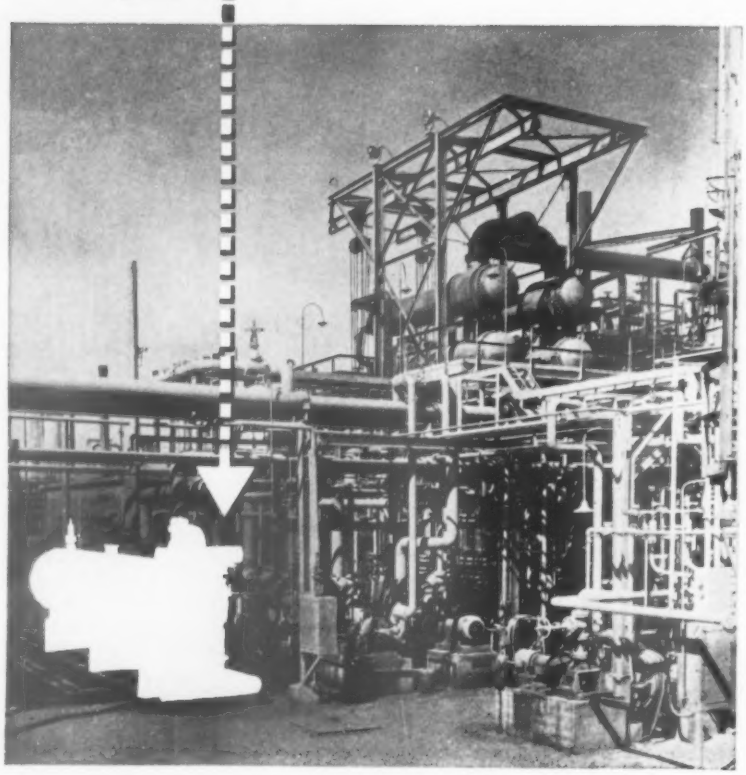
If so, investigate the G-R Waste Heat Steam Generator.

This unit uses waste heat to generate steam at boiler pressure from raw, untreated water. By doing so, it will reduce your process costs . . . your pumping costs . . . your cooling system load . . . and your boiler house steam demand.

The value of the steam produced by a G-R Steam Generator in the first year of service is usually sufficient to pay for the unit.

Various types are available to meet individual plant conditions and requirements, and special designs are available to reduce fouling of the tubes and scale accumulation.

Write for complete information on these heat-saving units that may effect important economies in your plant.



THE GRISCOM-RUSSELL CO., MASSILLON, OHIO

G-R HEAT TRANSFER APPARATUS **Steam Generator**

GR 288

Including these features

LE GRAND

Pumping Units are in service in many of the World's oilfields. They have many attractive features which make them the ideal choice for all pumping conditions.

Le Grand—O.C.T. wellhead and flow control equipment in a wide pressure range to suit all types of well is also manufactured under license from the Oil Center Tool Co., Houston, Texas, U.S.A.

Details of our complete range of equipment will be sent with pleasure upon request.

LE GRAND

LE GRAND, SUTCLIFF & GELL, LTD.

HORSTED AIRPORT, ROCHESTER, KENT, ENGLAND.

Represented in the following areas by agents who will be pleased to assist you.

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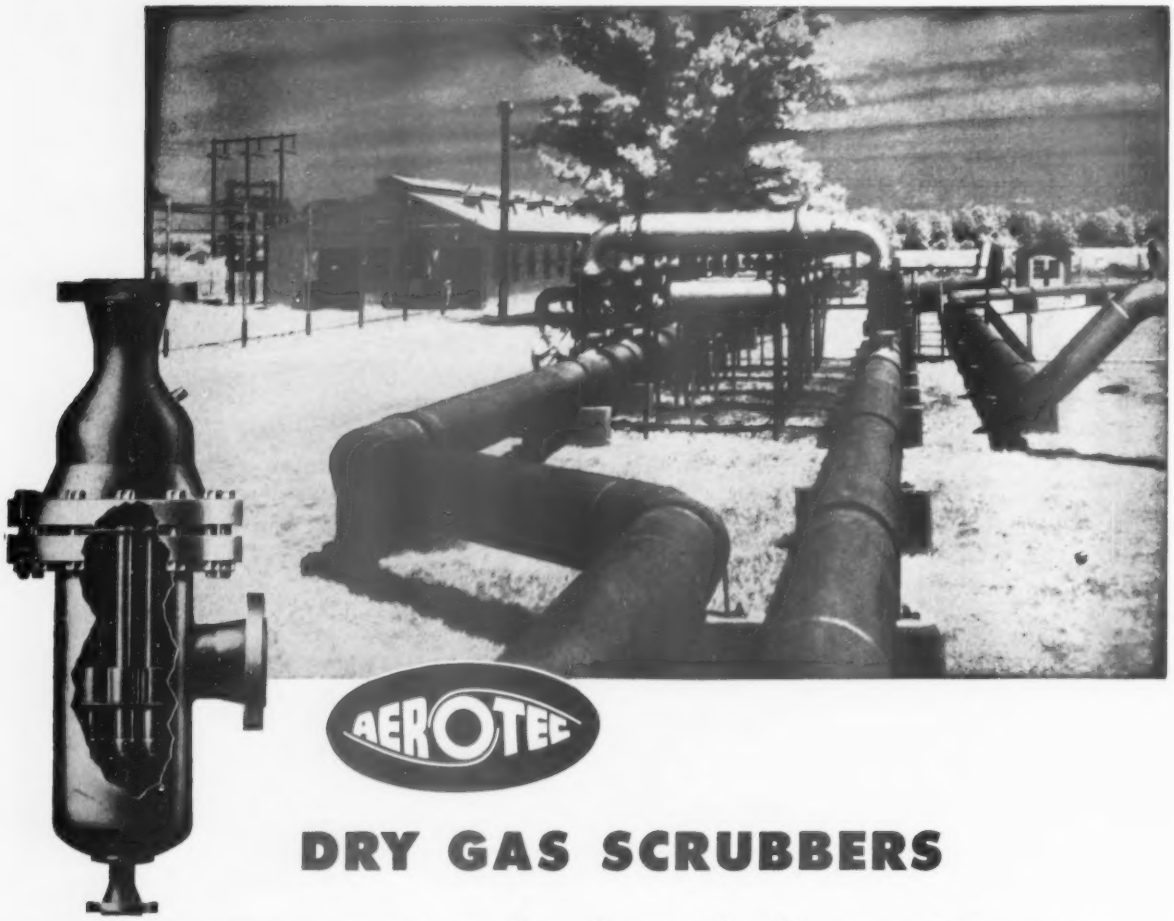
EASTERN VENEZUELA.—
A.-Z Export S.A.
Apartado 4026.
Puerto La Cruz.

WESTERN VENEZUELA.—
A.-Z Export S.A.
Apartado 304.
Maracaibo.



AEROTEC

DRY GAS SCRUBBERS

protect compressors and reduce pipeline maintenance

Dusts and distillates in natural gas put an unnecessary drag on profitable pipeline operation. Aerotec Dry Gas Scrubbers get rid of these damaging impurities with high efficiency, thereby reducing maintenance to a minimum. This is a proven fact in well and pipeline installations across the country.

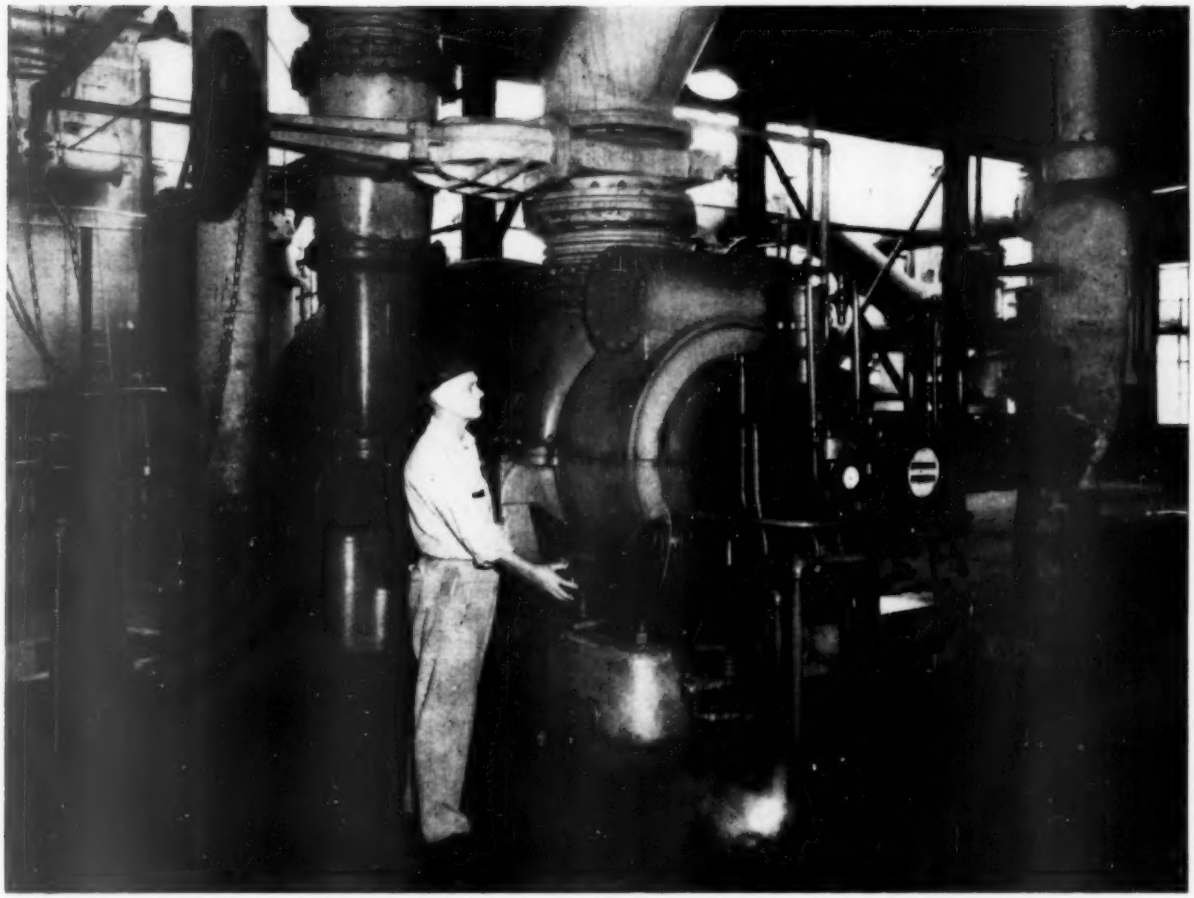
The Aerotec Scrubber, unlike conventional types, uses no liquid filtering medium. Hence, you eliminate carryover of elements that cause compressor wear. You also avoid other difficulties normally encountered with wet-bath scrubbing methods. The Aerotec units assure clean, *dry* gas that flows freely and saves on repair and maintenance costs.

Basis of this efficiency is a unique method of scrubbing gas by the use of multiple, small-diameter tubes. Through the principle of dry separation by centrifugal force, foreign solids and liquids are precipitated, leaving the gas clean and dry.

Simplified piping permits easy installation of the compact, lightweight Aerotec Dry Gas Scrubber. Standard units up to 100,000,000 SCFD are available, with larger capacity requirements met by manifolding. For technical data and engineering assistance in selecting the Aerotec Scrubber best suited to your gas-cleaning needs, call or write our representatives today.

Project Engineers **THE THERMIX CORPORATION** Greenwich, Conn.
(Offices in 38 Principal Cities)

Manufacturers
THE AEROTEC CORPORATION
GREENWICH, CONN.



WORTHINGTON 550-HP TURBINE, used to drive coke oven gas collection blower, is one of two units purchased by the Citizens Gas & Coke Company of Indianapolis. The first unit, installed in 1938, operated continuously until 1945, when the second unit was installed. Now the units alternate, providing continuous service.

Operating record of this Worthington blower-drive turbine brought repeat order

Fifteen years of dependable service and still going strong. That's the record of this 550-hp Worthington turbine, used for driving a coke oven gas collection blower.

The unit was purchased by the Citizens Gas & Coke Company of Indianapolis, Ind., early in 1938. Impressed by its performance, Citizens Gas & Coke installed another Worthington turbine in 1945 to drive a similar blower.

The long satisfactory experience that Citizens Gas & Coke has had with these turbines is duplicated by Worthington users everywhere.

Worthington turbines are ideally suited for blower or centrifugal compressor drives, since they are available in all sizes and speeds to give the most economical unit performance. Another advantage is the turbine's adaptability to various governing arrangements for precise control under all operating conditions.

Remember, the engineering of the drive is just as important as the engineering of the compressor or blower. Worthington's long experience in compressor-drive engineering is your assurance of getting exactly the *right* type and size drive for your needs. Write for Bulletin 1966 to Worthington Corporation, Steam Turbine Division, Wellsville, N. Y. T-3-3

A GREAT TEAM IN STEAM

WORTHINGTON

Steam Turbines

not one misrun in 2000 tests...

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HALLIBURTON'S *NEW* HYDROSPRING TESTER

BIG, NEW REASON WHY
HALLIBURTON'S BEST FOR YOUR DRILL STEM TEST!

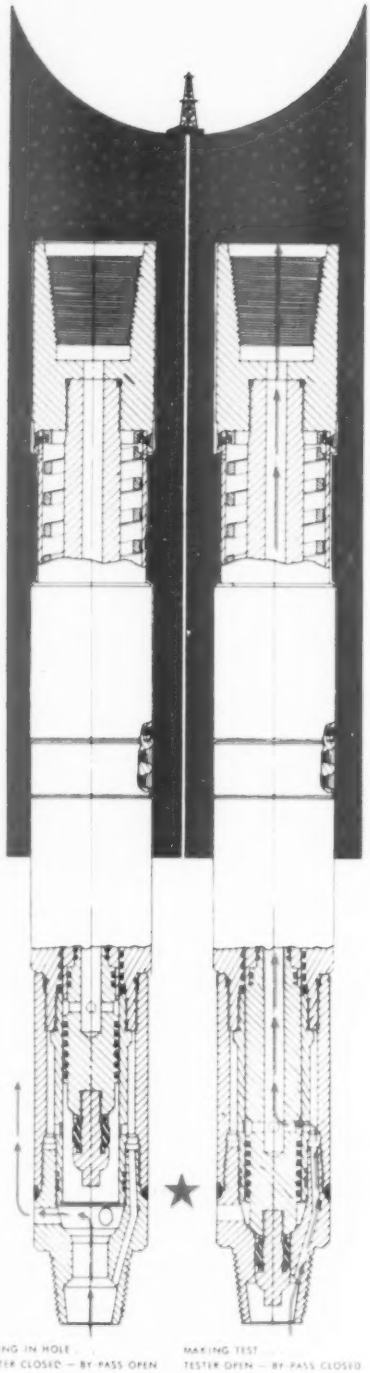
The perfect performance of Hydrospring makes history in the oil field. Never before has a testing tool racked up such a record, or offered so many new advantages to the operator.

Hydrospring is a combination Tester and Locked Open By-Pass operated by weight of drill pipe with positive indication at surface that tool is open. Main parts of the tool are: a spring to keep tool closed on surface and to help close tester when weight is removed; a fluid chamber with two-way valve that retards downward movement of mandrel but allows rapid upward movement; a sliding valve inside a cylinder to open and close the tester; a packing ring and metal seat to open and close the by-pass.

The two-way valve permits weight to be set down for a time interval, allowing packer to expand before tool opens, and prevents premature opening of tool if bridge is hit. Time interval is determined by weight set down, after which tester valve opens rapidly, giving definite movement on weight indicator needle. When weight is removed, mandrel returns to extended position, closing tester valve and opening by-pass.

So successful is Hydrospring that a perfect test is now taken for granted. Combined with the Bourdon Tube Pressure Recording Device, and Halliburton's million-job experience, there's no testing service in the country to compare with Halliburton's.

Your test is too important to pass up these advantages. Call in your Halliburton Testing Operator, only minutes away. Halliburton Oil Well Cementing Company, Duncan, Oklahoma.



GOING IN HOLE — TESTER CLOSED — BY-PASS OPEN

MAKING TEST — TESTER OPEN — BY-PASS CLOSED

Hydrospring — Patent Applied For

HALLIBURTON

YEARS AHEAD IN DRILL STEM TESTING!

Pulled after 4½ years in a sour well

—corrosion negligible

These Monel valves served 4½ years in a sour crude well. When they were pulled, they showed practically no corrosion.

Here's the story of seven veteran Monel® gas-lift valves.

These valves, made by GARRETT OIL TOOLS, INC., gave excellent service for 4½ years in a well producing sour crude.

Careful examination showed the valves to be in excellent condition. Years of exposure to highly corrosive well fluids had produced only negligible signs of attack.

With service records like these, it's no wonder that Monel has become the standard material for all GOT gas lift valves.

GOT made their first pressure charged gas lift valve in 1946. Some of them have been in continuous service as long as 6½ years.

The reason for this long service lies in the combination of the right material and correct design. In addition to all-Monel construction, for example, the seamless bellows — the very heart of the valve — is given extra protection against excess pressures, distortion and contamination. It is supported on the inside by a valve stem guide . . . and on the outside by a non-compressible liquid. This extra protection permits higher pre-charged dome pressures without damage to the bellows.

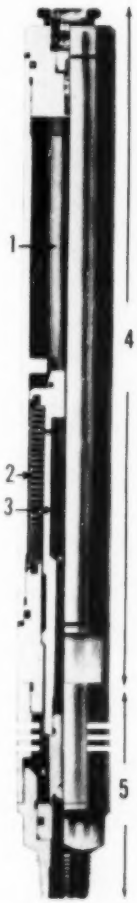
A pressure-charged dome replaces the pressure-charged bellows to hold the valve in closed position. The dome pressure can be changed in the field, permitting easy repair of valves as needed.

The fact that all types of GOT valves are interchangeable on one basic body reduces obsolescence and permits smaller inventories. Operators can thus easily convert their original valves to other types as well conditions change.

You can get detailed information on GOT valves by writing to Garrett Oil Tools, Inc., 2600 Nottingham St., Houston 5, Texas.

And remember, you can always call on Inco's Corrosion Engineering Section for help with your particular oil field corrosion problem.

It is advisable to place equipment orders with your supplier well in advance of scheduled use. Distributors of Inco Nickel Alloys can supply the latest information on availability from warehouse and mill.



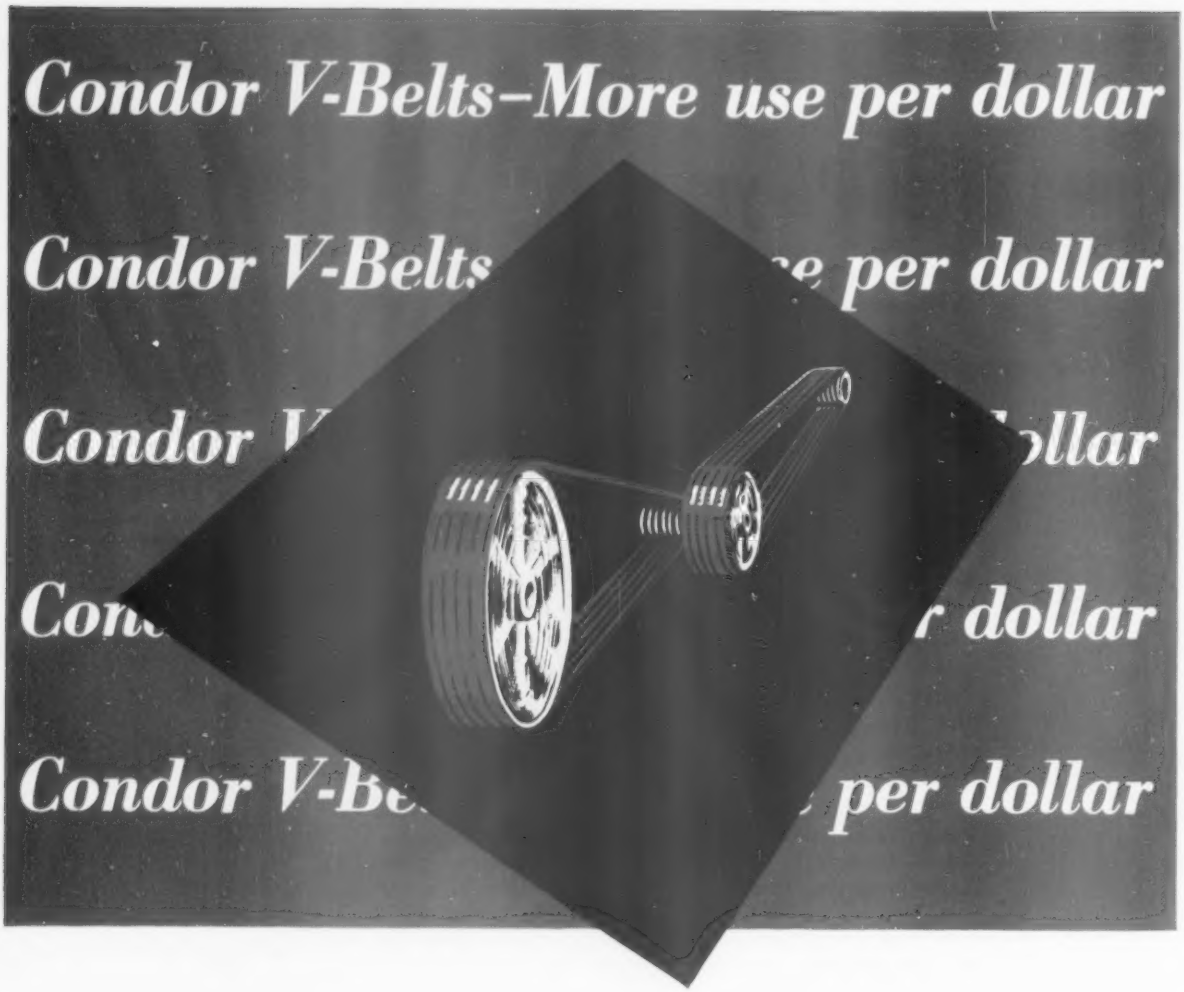
1. Dome
2. Bellows
3. Valve Stem Guide
4. Type "O" Body
5. Type "O" Head Piece Assembly

Cutaway view of the Type "O" GOT Pressure Charged Gas Lift Valve. The body and the internal parts are made of corrosion-resisting Monel.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inco Nickel Alloys

INCO **Monel** . . . *for minimum maintenance*



SMOOTHEST RUNNING V-BELTS MADE . . . The result—long life and low V-belt drive costs. Correct engineering makes the difference. Sidewalls are *straight* for more grip, less slip, longer life. The pulling section is micro-positioned. Every Condor V-Belt is correctly balanced and destretched during manufacture. This, too, means longer life. Also in special oil-, heat- static-resisting types . . . Get the engineering facts. Ask the R/M Distributor for Bulletin 6868 . . . He'll show how you also can get MORE USE PER DOLLAR with R/M hose, transmission and conveyor belts.

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Packaged Compressor Plant

These three packaged compressor plants are equipped with Ingersoll-Rand 330 h.p. 6SVG gas engine-driven compressors, Young radiators, and all necessary connections and controls. Other sizes from 110 h.p. to 550 h.p.

Oil wells in Turtle Bay Field, Texas, operated by Stanolind Oil and Gas Company, are produced with a rotative gas lift system. Gas within the system is constantly circulated at required pressure and excess gas is delivered to a nearby sale line. For this operation, a compressor station of approximately 1,000 horsepower was required. So a bank of three 330 horsepower Beaird-Ingersoll-Rand packaged compressor plants was installed.

These packaged compressors were delivered to the location as fully assembled units. Each one has all necessary gas piping and manifolds, complete systems for cooling, lubrication and air starting and integral automatic controls. Complete packaging at the Beaird factory reduced field assembly to a minimum, saving weeks of valuable installation time.

Let us tell you about the economies of using Beaird-Ingersoll-Rand packaged compressor plants in multi-unit installations.

Used three packaged units —

HOW TIME WAS SAVED IN INSTALLING A COMPRESSOR STATION

THE J. B. BEAIRD COMPANY, INC.

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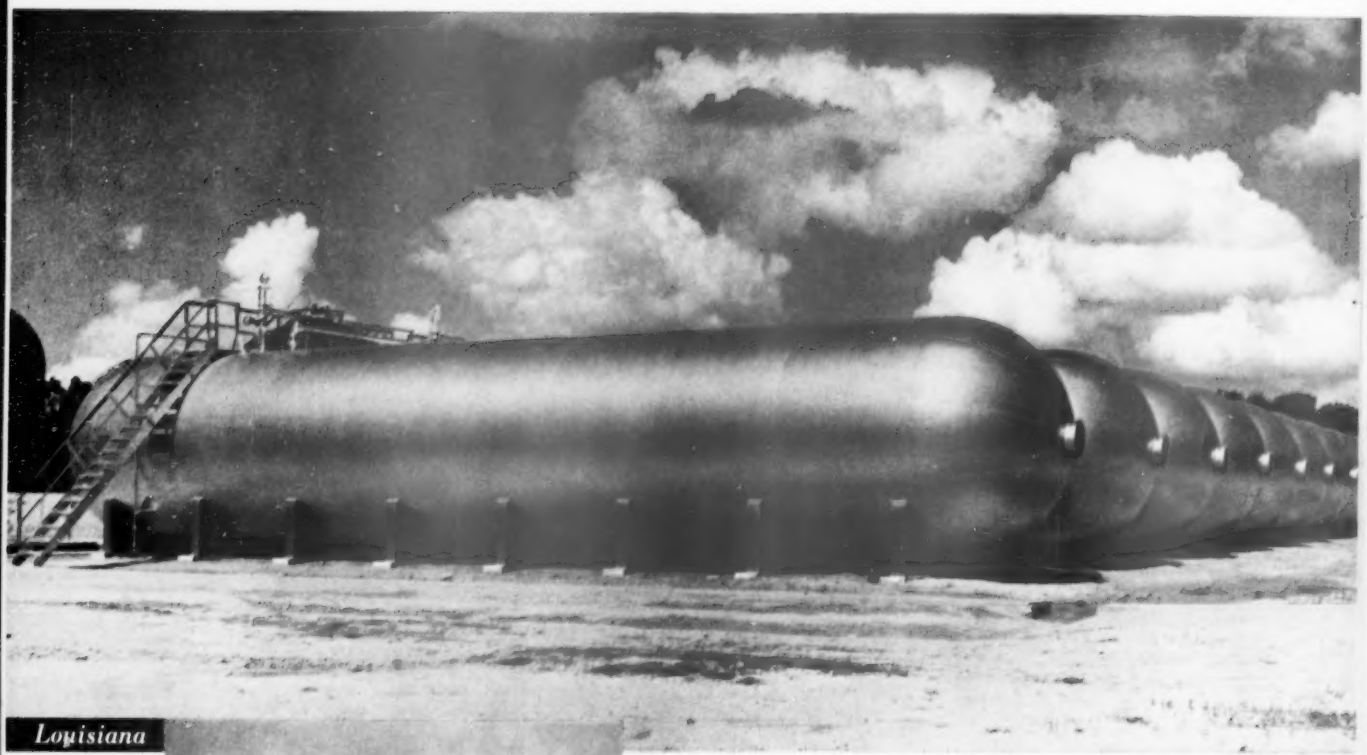
SHREVEPORT, LOUISIANA

MACHINING
FABRICATING
STEEL WAREHOUSE

Engineering For Safe Storage

BEAIRD PRESSURE STORAGE TANKS

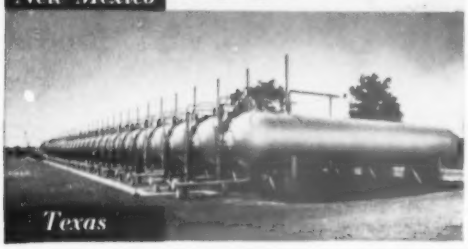


Louisiana

Nebraska

So. Carolina

New Mexico



Texas

All over the Nation

Here are a few of the installations of Beaird pressure storage tanks you'll find throughout the country—and there are many more. For Beaird has been manufacturing pressure storage equipment thirty five years. And during the past five years, Beaird production lines have been averaging one major size tank per day.

This demand for Beaird pressure storage tanks is no accident—it's the result of Beaird's advanced engineering design, constantly improved manufacturing techniques and thorough inspection and testing. That's why the firms which constructed these plants chose Beaird—that's why you too can have complete confidence in pressure tanks manufactured by Beaird.

Let us have the opportunity of discussing your pressure storage requirements with you.

THE J. B. BEAIRD COMPANY, INC.
SHREVEPORT, LOUISIANA

Packaged Compressor Plants

Cast Steel Fittings

BEAIRD

Machining
Fabricating
Steel Warehouse

Pressure Bulk Storage

Anhydrous Ammonia Equipment

LP-G Syste

They Say—

Hijinks in Economics

"The recent average 25-cent-a-barrel increase in the price of crude oil . . . constitutes some odd hijinks in economics. It will cost the consumer about 1 cent a gallon for his gasoline.

"The public is entitled to the facts. Several large companies with foreign holdings posted the increase, and the industry followed suit. This action is more a symptom of the oil industry's dilemma than a matter of supply and demand.

". . . the increase should be recognized for what it is—simply a sop to the domestic industry. It will tend to soothe the clamor for curtailed imports and persuade oil men to accept reduced production for a price increase."

Editorial in the Kansas City Star.

A Lesson for Foreign Operators

"So far this country and the free world have enjoyed good access to the floods of oil lately discovered in the Near East. But that access is vulnerable, not only because of the proximity of Russia but because of the rising tide of 'nationalism' in the politically and economically backward countries where the new reserves lie.

"Foreign oil corporations working in those lands will have to give more and more attention to the disaffection which their presence creates among the native populations. Some have been more successful than others in placating local hostility. The costly experience of a great British company in Iran is widely believed to have been due in part to too much reliance on legal rights under a government concession and too little attention to popular sensitivities."

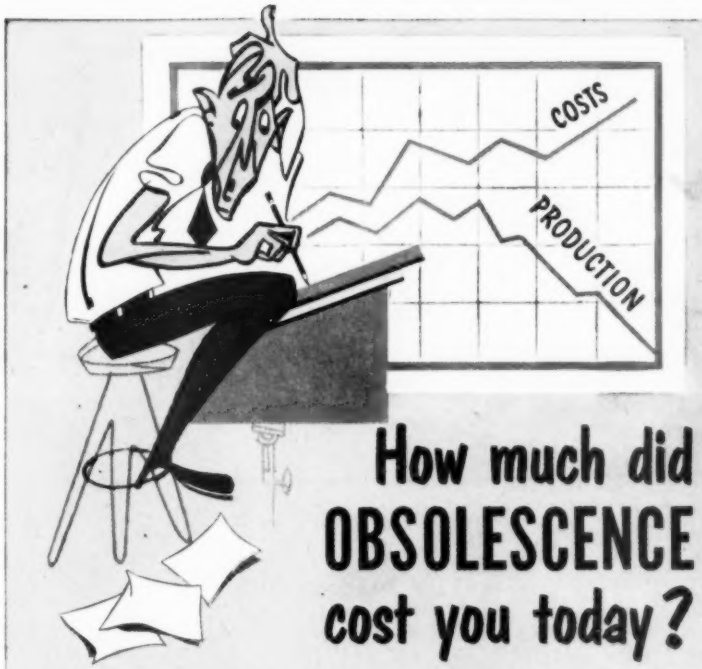
From an editorial in the Wall Street Journal.

Kentucky Enters Tidelands Case

"Kentucky's Attorney General Buchman offers to join the Arkansas suit against giving title to offshore oil land to the few coastal states. In doing so he speaks in the direct interest of sound national policy.

"It is a question of national security and the proper conservation of national resources in the name of all people. It is a question of rights of all against the special interests of those in Texas, California, Louisiana, and Florida, who stand to profit exclusively by the great giveaway of offshore oil.

"It is also a serious constitutional question. The Supreme Court in two



How much did OBSOLESCENCE cost you today?

The fastest way for a machine to become obsolete is for someone to develop a new machine to do the same job faster, better, and more economically.

Look at it this way. Say you operate a machine tool that turns out 50 work units an hour. If your competitor installed a 100-unit-per-hour machine at a price comparable to yours, his competitive unit cost would give you trouble. In effect, the minute he went into production, your machine became obsolete.

When it comes to constant efforts to improve our product, CLARK pleads guilty. The quality fork truck that you bought some years ago may be secretly (to you) suffering from obsolescence, even though it is still doing the job you bought it for. It's not hard to recognize obsolescence when it shows up in high maintenance costs and repair bills. But that's only going skin-deep. The important thing to know is this: how much faster, how much better and at how great a savings can you do the same job with today's CLARK trucks.

New CLARK Trucks to replace your obsolete equipment will step up production and cut service charges so drastically that they'll soon pay for themselves.

How much did obsolescent handling equipment cost you today? You owe it to yourself to know—and then to capitalize on that knowledge by calling in your nearby CLARK Dealer. He'll help you set up a *profitable* modernization program.

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AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

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"THE PERFECT SEAL"

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No magic... No magnetism... lapped wring fit of every Okadee Valve disc and seat must pass this test of a perfect sealing surface. (unretouched photo)

...Here's What it Means to You in Terms of Valve Service

Flat mating surfaces within .000005", or less, of every set of Okadee valve discs and seats mean absolute shut-off of any material from ammonia gas to asphalt.

How long does this seal last in service? We honestly don't know. Tests under working conditions with propane were stopped after 269,000 operating cycles when no wear or seal failure could be detected. And Okadee valves do not have to be babied in service on corrosive or abrasive materials . . . Thousands of boilers have had Okadee blow-down valves in continuous, trouble-free service for fifteen years or more. If Okadee size-pressure-temperature ranges include your valve applications, Okadee installation will end your problems of valve performance once and for all.

Okadee valves are available in single-disc (one direction) and double-disc (two directions) types; screwed or flanged; ½" to 6" in standard A.S.A. dimensions; steel or semi-steel bodies (other materials to order); stainless steel or stellite seat facings; levers, rack-and-lever, worm-gear, hydraulic, pneumatic, automatic on-off control.

Write for Bulletin 332-C today!

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decisions made this plain . . . first as to California's claim, then as the claims of Texas and Louisiana.

"In the face of these rules . . . failure of other states to test the congressional act would be a dereliction of plain duty. And beyond the legal support for the Arkansas suit, there is the practical benefit which the other 44 states have a right to claim through common ownership."

From an editorial in the Louisville (Ky.) Courier-Journal.

Imports Fight to Continue

"The Simpson bill (H.R. 5894) was rejected in the House of Representatives . . . by a coalition of the New Deal-Fair Deal-Republican administration, and Republican administration, and Republican and Democratic House leadership.

"We will continue this fight. We have lost only the first skirmish. The campaign will be continued until we can convince a majority of the Congress of the justice of our cause. The greatest thing to fear is that we can't get it done in time to prevent economic strangulation and chaos in our domestic economy by ever-increasing imports of more cheaply produced and marketed foreign products.

"Everywhere we got the chance to tell our story, we convinced a majority of those who listened, until the politicos who wouldn't listen got in their hatchet work.

"The Congress will adjourn at an early date and the members will return home. The most effective work can be done by the home folks at the 'grass roots' level. We are already working from here with our eye on the next session of Congress which convenes in January."

A public statement issued by Tom Pickett, executive vice president of the National Coal Association, Washington, D. C.

Soviet Offers Oil for Food

"Observers of Soviet Russia outside of the Iron Curtain are puzzled these days by reports that the Kremlin is offering oil and oil-drilling equipment in exchange for food, hides, and fishing boats. A guess answer to the question of how this can be is that it signifies both a major degree of progress in Soviet oil production and a new economic policy of giving the Russian people more consumer goods.

"The Russian offers are said to have been made to Japan and Argentina. Russia wants the fishing boats from Japan and meat, hides, and cheese from Argentina.

"Russia has been unwilling or unable to export oil since the end of World War II. All indications have been that

she has had a serious oil problem, and the estimates of Western experts has been that Russian oil production has risen only about one-third in the face of heavy domestic demand caused by industrial expansion and the demands of China caused by the Korean War.

"It is not believed that Russia has a genuine surplus of oil. Instead, it is thought that the Malenkov government is making an effort to popularize itself a bit by alleviating to some extent long-time distress among the Russian people."

Editorial in the Houston Post.

CALENDAR

AUGUST

17-19 Society of Automotive Engineers, international West Coast meeting, Georgia Hotel, Vancouver, B. C., Canada.

18-21 American Institute of Electrical Engineers, Vancouver Hotel, Vancouver, B. C.

24-26 Appalachian Gas Measurement Short Course, West Virginia University, Morgantown, W. Va.

Aug. 31-Sept. 1 Interstate Oil Compact Commission, Northern Hotel, Billings, Mont.

SEPTEMBER

6-11 American Chemical Society, national meeting, Conrad Hilton Hotel, Chicago.

9-11 Pacific Coast Gas Association, San Francisco.

11-12 Association of Desk and Derrick Clubs of North America, annual meeting, Cosmopolitan Hotel, Denver.

13-16 American Institute of Chemical Engineers, Fairmont and Mark Hopkins hotels, San Francisco.

15-16 American Petroleum Institute, executive committee, Greenbrier Hotel, White Sulphur Springs, W. Va.

16-18 National Petroleum Association, annual meeting, Hotel Traymore, Atlantic City, N. J.

21-22 Natural Gasoline Association of America, fractional analysis seminar, Texas Hotel, Fort Worth.

21-25 Instrument Society of America, national instrument conference and exhibit, Sherman and Morrison hotels, Chicago.

22-25 Corrosion short course, Texas A. & M. College, College Station, Tex.

24-25 Western Petroleum Refiners Association, regional meeting, Henning Hotel, Casper, Wyo.

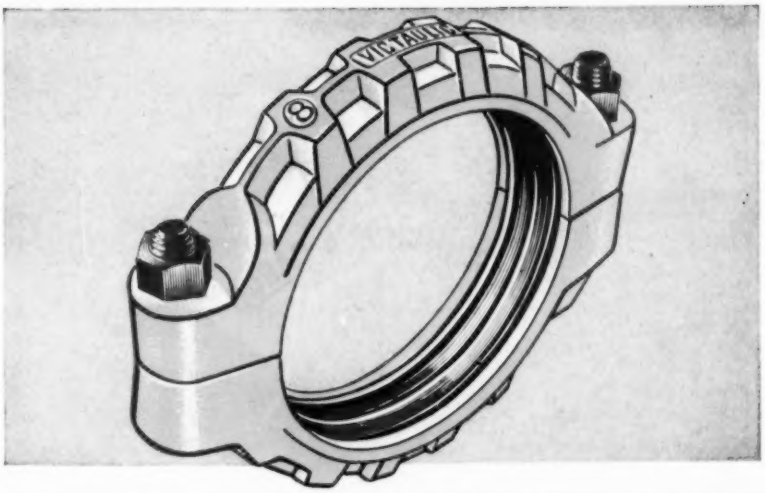
27-30 American Society of Mechanical Engineers, annual conference, petroleum division, Rice Hotel, Houston.

Sept. 27-Oct. 2 American Society for Testing Materials, Committee D-2 on petroleum products and lubricants, Shoreham Hotel, Washington, D. C.

28-29 Independent Natural Gas Association of America, Shamrock Hotel, Houston.

Sept. 30-Oct. 2. American Association of Petroleum Geologists, Mid-Continent regional meeting, Masonic Building, Wichita.

Sept. 30-Oct. 2 National Association of Corrosion Engineers, Permian Basin section, bian-



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"YOU CAN'T BEAT A CARCO WINCH FOR PIPELINE WORK"

LAYING PIPELINE is an old story to B. C. Hall, spread superintendent, River Construction Co., Fort Worth. Like all experienced pipeline men, Mr. Hall makes sure he has the equipment needed to do the job profitably. Mr. Hall's spread kicked off recently with a triple crossing of the Trinity River, near Goodrich, Texas. The river, where pipe crosses, is 260 feet, edge to edge, with swift current and quicksand conditions. For dredging the ditch, one tractor-mounted Carco winch was used to anchor and keep tight the pullback line for the dredge . . . another tractor-mounted Carco winch controlled the stabilizer line. Over-all time, including rigging time, to pull the first pipe across was two hours. One tractor-mounted Carco winch pulled a 450-foot, 20-inch pipe section, weighing approximately 110,000 pounds, across this 260-foot river in 30 minutes.

Mr. Hall, speaking from firsthand knowledge, says, "on pipeline work you can't beat a Carco winch for efficiency, power and long life."

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nual field tour, Lincoln Hotel, Odessa, Tex.

OCTOBER

1- 2 Mid-Continent Oil and Gas Association, Louisiana-Arkansas division, annual meeting, Roosevelt Hotel, New Orleans.

4- 6 American Association of Oilwell Drilling Contractors, thirteenth annual meeting, Cosmopolitan Hotel, Denver.

5- 7 Petroleum Electric Power Association, silver anniversary meeting, Muehlbach Hotel, Kansas City.

6- 7 Texas Mid-Continent Oil and Gas Association Rice Hotel, Houston.

7- 9 National Association of Corrosion Engineers, south central region, Mayo Hotel, Tulsa.

8- 9 California Natural Gasoline Association, annual fall meeting, Ambassador Hotel, Los Angeles.

11-17 Oil Progress Week.

12-16 Short course on cathodic protection, University of Illinois, Urbana.

19-21 American Institute of Mining and Metallurgical Engineers, petroleum branch, fall meeting, Dallas.

19-20 Independent Petroleum Association of America, annual meeting, Texas Hotel, Fort Worth.

22-23 Western Petroleum Refiners Association, regional meeting, Garrett Hotel, El Dorado, Ark.

22-24 Gulf Coast Association of Geological Societies, third annual convention, Shreveport.

23 Natural Gasoline Association of America, regional meeting, Blackstone Hotel, Tyler, Tex.

26-29 American Gas Association, annual conference, Kiel Auditorium, St. Louis.

27 Association of Consulting Chemists and Chemical Engineers, Inc., annual meeting, Hotel Belmont Plaza, New York City.

29-31 Rocky Mountain Oil and Gas Association, annual convention, Cosmopolitan Hotel, Denver.

NOVEMBER

3- 4 Society of Automotive Engineers, national diesel-engine meeting, Conrad Hilton Hotel, Chicago.

5- 6 Society of Automotive Engineers, national fuels and lubricants meeting, Conrad Hilton Hotel, Chicago.

5- 6 American Association of Petroleum Geologists, Pacific section annual meeting, Hotel Biltmore, Los Angeles.

9-11 Geological Society of America, annual meeting, Royal York Hotel, Toronto, Ont.

9-12 American Petroleum Institute, annual meeting, Conrad Hilton Hotel and Palmer House, Chicago.

12-13 Society of Exploration Geophysicists, midwestern meeting, Adolphus Hotel, Dallas.

19-20 National Association of Corrosion Engineers, western region, fall conference, Biltmore Hotel, Los Angeles.

19-20 Annual Instrument Short Course, Los Angeles Harbor Junior College, applied technology division, Wilmington, Calif.

20 Natural Gasoline Association of America, regional meeting, Herring Hotel, Amarillo, Tex.

Nov. 29-Dec. 2 American Society of Mechanical Engineers, Statler Hotel, New York City.

DECEMBER

1- 4 Corrosion conference, University of Oklahoma, Norman.

13-16 American Institute of Chemical Engineers, annual meeting, Hotel Jefferson, St. Louis.

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THE OIL AND GAS

JOURNAL

TULSA, OKLAHOMA

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JOURNALLY Speaking

Leg Man

THE JOURNAL'S intrepid reporters let nothing stop them from completing their assignments — although sometimes they get delayed a little bit.

Take the case of Dahl Duff, our International Editor. Dahl and his family were week-ending at a beach near his home on Long Island when he got soused by a big wave. Exactly what happened he can't explain, but he found himself washed up on the beach like a piece of driftwood and with a leg broken in three places. Dahl's an Oklahoma boy, and not too acquainted with the wiles of the fickle sea.

That explains why the Journal didn't print its exclusive monthly report on world crude-oil production on schedule in the fourth issue in July, for this is prepared by Dahl Duff from various mysterious and secret sources he alone knows how to tap. But you may have noticed that the world production report was in last week's issue, big as life. It developed that Dahl had a telephone extension run to his bedside at home and, though he is in a cast from hip to toenail, he somehow managed to manipulate a typewriter. He writes that he expects to be able to keep up his copy output from now on despite these handicaps, since he usually did most of his "leg work" by telephone anyway.

"Now I know why they call them breakers," he says. "But I wish I'd been hit by a truck. You can't sue the Atlantic Ocean."

No Story

THERE was big excitement in the Journal offices last week. The routine monthly figures on imports of crude oil showed that a tankerload of crude oil from Iran had been imported into the United States in May.

This looked like a sensational story. "Stolen" oil which the Iranian Government is offering at one-half world prices being sneaked into this country without anybody knowing it and in spite of all the efforts of the expropriated Anglo-Iranian Oil Co. to prevent such shipments until Premier Mossadegh makes a settlement. Brother, would the independent producers scream about that!

All our district editors were instructed to do some gumshoe work and run down this shipment. First heard from was Anglo-Iranian, which, with characteristic British conservatism, commented that the correctness of the information was subject to some doubt. But then the U. S. Department of Commerce, which issued the figures, said that its work sheets showed that 115,000 bbl. of Iranian crude oil had entered the San Francisco customs district in May.

So we burned the wires to Frisco. Finally came the denouement. Some clerk out there had made a mistake. The crude really came from Kuwait. Commerce would issue a correction. No story. The corrected table was printed in last week's issue, unsensationally. But it shows to what lengths we go to give our readers the truth, the whole truth, and nothing but the truth, s'help us.

Hot Idea

IF the butter is too hard to spread, set fire to it and the heat will soften up what doesn't burn.

That (more or less) is the principle of a new process of oil production described in this issue under the esoteric name of "in-situ combustion." If crude oil is too gooey to pump, set it on fire and melt it down until it runs into the wells.

Sounds crazy, particularly when you realize that the oil may be mixed with water and packed into the pores of a hard rock several thousand feet below the surface. But it doesn't sound crazy to the Socony-Vacuum engineers who have been working on the idea for 6 years. They're so proud of it that they're letting our favorite oil publication tell the whole industry about it. They plan to do a lot more experimenting to get the bugs out of the process, but results so far are so encouraging that they are offering it as a promising method of producing heavy crude oil.

Henry D. Ralph

YOU CAN SAVE CASING

BY STAGE CEMENTING THE BAKER WAY

With *only one* string of casing you can cement off at the shoe *and* shut off surface water. Or you can cement a well with *two producing zones* and be assured of a good cement job for the upper zone. And you *never* need risk breaking down a comparatively weak formation by high cementing pressure and the extreme weight of a long cement column.

IT'S SIMPLE, SPEEDY AND SAFE to perform two-stage cement jobs with Baker Stage Cementing Collars (Product No. 200-F) in combination with other Baker Equipment. In addition to positive, mechanical closing of the cementing ports upon completion of the second stage, you are assured of these outstanding advantages:

1. After the second stage has been completed, an external steel sleeve with an oil-resistant synthetic rubber seal provides positive closure and prevents passage of fluid between the inside and the outside of the casing, regardless of the condition of the cement job at that point.

BAKER STAGE CEMENTING COLLAR

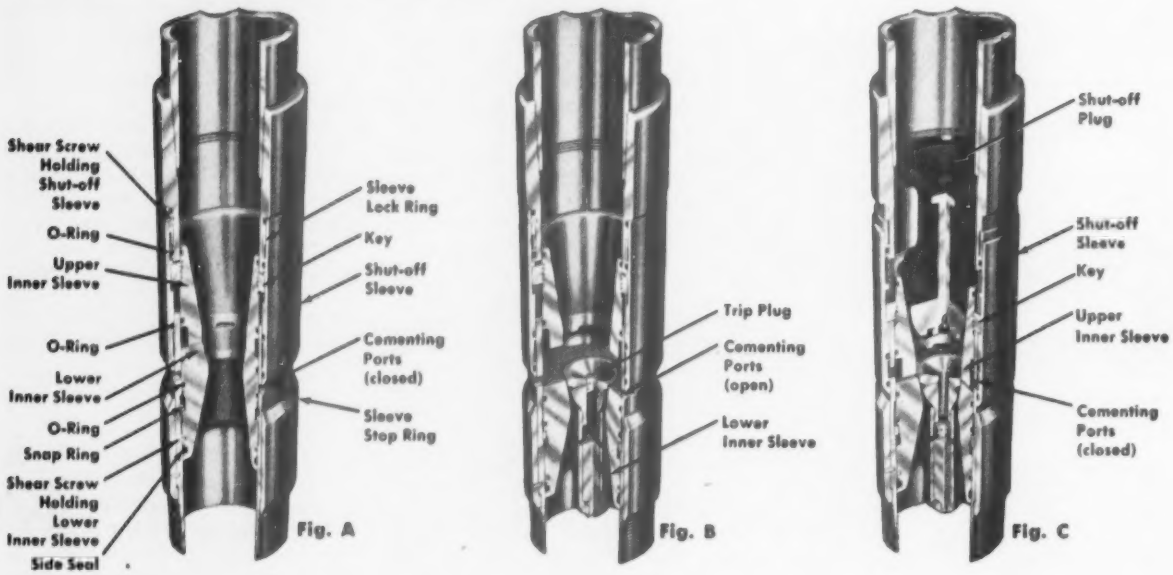


Fig. A—Ready for cementing the first stage. The cementing ports are covered by the Lower Inner Sleeve which is held in position by shear screws; shear screws also hold the Shut-Off Sleeve above the cementing ports.

FIG. B—Ready for cementing the second stage. After the Trip Plug is seated, application of hydraulic pressure shears the screws holding the Lower Inner Sleeve which moves downward, thus uncovering the cementing ports. The Trip Plug prevents passage of fluid into the casing below, and cement pumped into the casing will now pass through the cementing ports for the second-stage cementation.

FIG. C—Second-stage cementation is completed. The Shut-Off Plug has been pumped down the casing and pressure applied to shear the screws and move the Shut-Off Sleeve downward to close off the cementing ports. Note how the Sleeve Lock Ring has expanded to lock the Shut-Off Sleeve in position permanently covering the cementing ports.

2. The cementing ports of the Stage Cementing Collar may be opened at any time after completion of the first stage, and fluid may be circulated through the stage collar for any desired length of time before starting second-stage cementing.
3. Operation of the stage collar is effected by fluid pressure applications only, and no movement of the casing is required after the first stage of the cementation has been completed.
4. All internal parts of the Baker Stage Cementing Collar are constructed of readily drillable materials, and when drilled out there are no sharp shoulders or irregularities to interfere with the subsequent passage of tools through the collar.
5. Since the steel Shut-off Sleeve is on the outside of the Stage Cementing Collar, there is no possibility of accidentally opening the cementing ports when drilling out the internal mechanism, or later when bits or casing scrapers are run through the collar.

Ask any Baker representative or office for recommendations to make your stage cementing operations successful, "first-time" accomplishments.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

Here's a chance to solve the imports problem

THE first round in the battle in Washington over imports of foreign oil is over. The next round is scheduled for next spring.

The House has sent back to its committee on ways and means the Simpson bill which proposes specific quota limitations on quantities of crude and heavy fuel oil permitted entry. Congress has passed a bill extending the reciprocal trade agreements law until June 1954 and including a provision for a special study of petroleum and other imports problems.

President Eisenhower has stated that he presently is opposed to limitations on imports of oil, particularly from other countries of the Western Hemisphere. He has suggested study of proposals for some sort of voluntary agreement to keep imports in line with domestic production.

THIS should give both domestic and foreign oil producers an opportunity to approach the imports problem with light rather than heat. The administration is openly inviting the industry to work out a practical, long range plan as a substitute for the arbitrary restrictions of a federal law. Invitations like this have not been common in recent years.

This challenge to industrial statesmanship should be taken seriously. In view of its experience in cooperation during and since the war and its agreement on the import policy statement of the National Petroleum Council it should not be too difficult to draft a satisfactory plan which would be acceptable to the Government.

AFTER all, only a relatively small percentage of United States oil consumption is involved in the difference between imports which "supplement" and those which "supplant" domestic production. Domestic producers don't want to exclude imports entirely; neither do they seek high tariff rates to keep prices at artificial levels. What they want is machinery to keep a flood of imports from taking a disproportionate share of the market, upsetting domestic operating programs, and interfering with state conservation procedures.

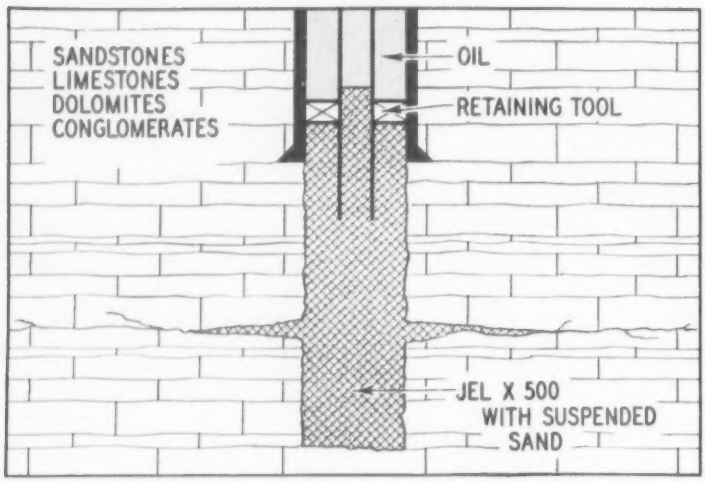
THAT'S reasonable. The first thing needed is better agreement on a set of conditions which indicate when imports are reaching a "peril point." The next thing is creation of an industry group, working under the eye of the Government, to apportion imports on a fair basis, all things considered.

Such an arrangement can protect the interests of producers, importers, and consumers, and provide far greater flexibility than any sort of formal government machinery.

Oil men say they abhor federal legislation but want a chance to work out industry problems themselves. Here is such a chance.

PRODUCTION INCREASED 26 BOPD WITH DOWELL STRATAFRAC

New Dowell Service Combines Advantages of Acidizing and Fracturing in Single Treatment



This well's initial production was 19 BOPD. While the well had not declined, it was not considered good for its location. After various other remedial methods had failed, a Dowell Stratafrac treatment increased oil production to 45 BOPD. Payout time was estimated at 36 days.

Stratafrac treatments using Jel X 500 have increased production from all types of oil bearing formations—limestone, dolomite, sandstone, chat and conglomerate. This service is designed to fracture and acidize the formation in a single operation.

Stratafrac treatments carry suspended sand into existing fractures as an abrading and propping agent. They are also designed to remove paraffin or other heavy hydrocarbons present in the fractures or formation.

Stratafrac treatments are engineered to save you money by holding rig time to a minimum. All materials arrive at the well ready-mixed. No jel-breaker solution is needed following Stratafrac treatments, as the material returns to the well bore as a thin, free-flowing liquid. The well can be returned to production immediately without costly shut-in time.

GET THE FACTS ON STRATAFRAC! Find out how Stratafrac has increased production in many fields. For a more detailed discussion on this new Dowell service, call your nearest Dowell station or write direct to Tulsa, Dept. J-11.

DOWELL SERVICE

Acidizing • Perfojet • Electric Pilot • Paraffin Solvents
• Fracturing • Corban® • Jelflake® • Bulk Inhibited
Acid • Chemical Cleaning for Heat Exchange Equipment

DOWELL INCORPORATED • TULSA 1, OKLAHOMA
A Subsidiary of The Dow Chemical Company

"First in Oilfield Acidizing . . . Since 1932"

Look to DOWELL
FOR OIL INDUSTRY CHEMICAL SERVICE

THIS WEEK

CONTROL of Platte Pipe Line Co.'s 1,149-mile crude system from western Wyoming to Wood River, Ill., can be exercised by one man in this ultramodern control room at Platte's Kansas City, Mo., headquarters. From this room tanks can be gaged, pumps started or stopped, and valves opened or closed. Dedication ceremonies for the big carrier were held August 8 at the Casper, Wyo., pump station (see page 72 in this issue). Speakers were Frank Porter, A.P.I. president, and Sen. Hugh Butler, Nebraska.

GOVERNMENT.—Immediate resumption of drilling on the Continental Shelf in the Gulf expected as a result of bill passed by Congress setting up administrative procedure for offshore operations. . . . Regulations under which additional leases may be granted probably will be promulgated before end of this year. . . . ¶Louisiana's Digby to take office shortly as FPC member succeeding Wimberly. . . . New appointee is conservative southern Democrat supported by oil industry representatives and oil-state officials. . . . ¶Congress winds up session with record showing many new laws affecting oil. . . . Many other bills concerning industry, however, passed until next session. . . .

PRODUCTION.—Magnolia takes wraps off new secondary-recovery technique which the company is convinced will lead to production of large quantities of low-gravity crudes now considered virtually unrecoverable. . . . Method involves controlled burning of small percentage of oil in reservoir to raise viscosity of the remainder. . . . ¶Court order issued in California shuts in 27 oil wells in Coalinga Nose field for wasting natural gas. . . . Long Beach Board of Harbor Commissioners approves proposal calling for development bids on 1,425 semiproved acres of submerged lands south of present production in the harbor. . . .

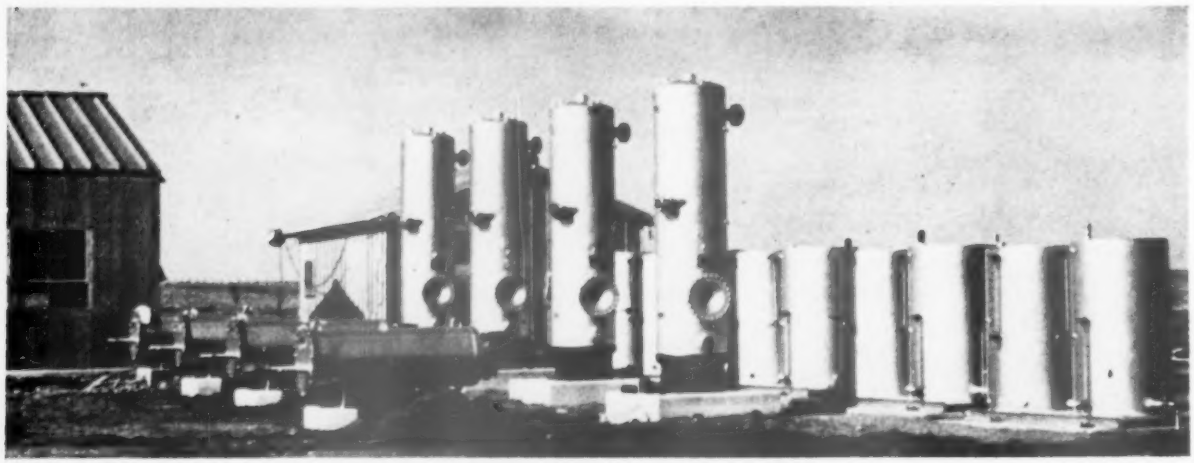
PIPE LINE.—Platte dedicates 1,149-mile crude line connecting Rocky Mountain crude-producing areas with Wood River, Ill., refining center. . . . Line ultimately will carry 150,000 bbl. of crude daily. . . . ¶Pioneer system, 290-mile line carrying products from Sinclair, Wyo., to Salt Lake marketing area, to be officially opened August 10. . . . ¶Texas Eastern announces completion of gas trunk line between Provident City, Tex., and Castor, La., and of system built by its subsidiary, Wilcox Trend Gathering System. . . .

INTERNATIONAL.—Russia offers oil for food. . . . Observers believe it is excess from military stockpiles and foresee no danger at present to world crude market. . . . ¶Shell Group adding new units, increasing capacities at eight refineries abroad. . . . ¶Gulf, Shell become last two companies to meet 3-cent reduction in Middle East crude prices. . . . ¶Japanese Government sells naval fuel-oil depot and refinery at Tokuyama, Yamaguchi Prefecture, to Showa Oil Co. . . .

EXPLORATION.—Amerada deep test in Beaver Lodge, North Dakota's first field, recovers oil in drill stem between 10,442 and 10,500 ft. in Devonian, indicating new pay for field. . . . Rank wildcat being drilled by Humble 75 miles southwest of Santa Fe, N. M., and 200 miles northwest of nearest production gets encouraging shows in unidentified formation. . . .

TRENDS.—Refinery runs for week ended August 1 averaged 7,024,000 bbl. daily, down 101,000 bbl. daily from previous week and 9,000 bbl. daily from corresponding week last year. . . . Except for the period of the refinery strike last year, the week of August 1 was the first time in over 3 years that runs for the current week were less than for same week a year earlier. . . . California reported the only increase in runs over previous week. . . .

ACTIVITY.—Crude and lease condensate production averaged 6,534,125 bbl. daily for week ended August 1, down 5,250 bbl. daily. . . . ¶Total well completions decreased 107 wells for the week to 938. . . . ¶Wildcat completions totaled 217 compared with 248 for previous week and 206 for the same week last year. . . . ¶Rotary rigs operating in the United States increased 33 rigs for week ended August 3 to 2,624. . . .



FIVE-SPOT COMBUSTION EXPERIMENT is currently being conducted by Magnolia in a southern Oklahoma field. Shown here are the gathering systems for each of the four producing wells, including heaters, gas-oil separators, and tanks. In the left background is the operations building which houses the air compressors, control and measuring instruments, test laboratory, and office.

Production by Fire

Magnolia perfecting method which involves burning small percentage of oil in place to hike recovery of remainder

DALLAS.—A new method of secondary recovery of heavy crude by burning some of the oil in the reservoir in order to heat the rest of it is being perfected by Magnolia Petroleum Co.

After 6 years of laboratory and field experiments the process looks so promising that the company has released details of the method which it says may lead to the recovery of large quantities of low-gravity crude now considered virtually unrecoverable.

Field tests conducted in southern Oklahoma last summer indicate that crude can be ignited in the reservoir and the rate of burning controlled by the amount of air forced down the input well. By burning less than 15 per cent of the oil in place as fuel, the viscosity of the rest of the oil in the reservoir was reduced sufficiently to permit recovery of 60 to 90 per cent of the original oil when pushed to producing wells by air or gas.

The idea of "in-situ combustion" (burning in place) is not new. There have been many articles written on the subject by both American and European engineers. Several American oil companies hold patents on various processes. However, Magnolia engineers say their process is the only one which has been proven practical by pilot field tests.

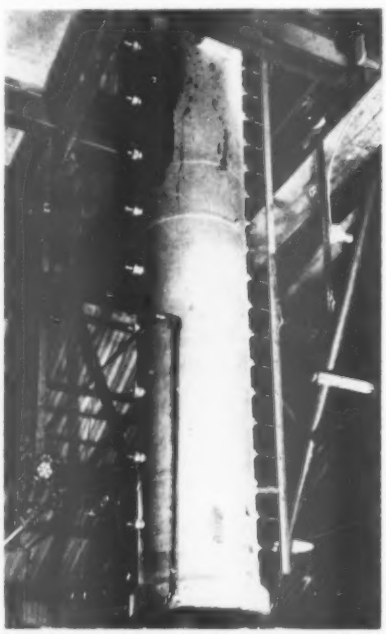
The experiments were undertaken 6 years ago as a joint research venture of Socony-Vacuum Oil Co. and its affiliates, Magnolia and General Petroleum Corp. It is estimated that there are approximately 4 billion barrels of heavy crude in proven reservoirs in the United States which are unrecoverable by other known methods.

Lab work . . . Early experiments in Magnolia's Dallas laboratory were with small tubes packed with sand, oil, and water. It was found that heavy crude would burn if sufficient air was supplied under pressure. The experiment was then transferred to large steel chambers of various sizes, in both vertical and horizontal positions. These tubes were fitted with instruments to measure conditions in the sand-oil-water pack.

In the summer of 1952 the tests were transferred to an actuated oil field. The site was a sand lens in southern Oklahoma about 20 ft. in thickness and 180 ft. deep, and containing crude of 18.5° gravity, with an oil saturation of 60 per cent and a porosity of 29 per cent. Three wells were drilled in a straight line, 20 ft. apart. The oil was ignited and combustion rate controlled by a specially designed electrical heater lowered into the middle or input well.

It took 55 days for the burning front to travel the 20 ft. to the producing well, and core tests showed that only the top layer of the sand was burned. Heat from the fire advanced in all directions ahead of the actual combustion, reducing the viscosity of the crude, and there was evidence that the heavy constituents of the crude were turned into coke ahead of the flame and that only this coke actually burned.

Five-spot test . . . On this basis, Magnolia engineers made calculations on



LARGE COMBUSTION TUBE packed with sand, oil, and water was used in second phase of lab work on new method. This tube, shown with bottom head removed, was 10 ft. long, 12 in. in diameter. Packing assemblies at left are differential manometer connection points. The small tubes protruding from the right are pencil-type thermocouples spaced at 6-in. intervals.

performance in a five-spot operation with wells 50 ft. apart. If the temperature is raised to 1,100° F. for 40 per cent of the distance between wells and then the fire quenched, they figured, the heat would continue to travel through the reservoir for 2 years. By that time the reservoir near the production wells would have a temperature of 175° F., which they believe is high enough to reduce the viscosity of the crude sufficiently to permit very substantial recovery and give exceedingly high utilization of the thermal energy produced.

The companies are now engaged in field tests of in-situ combustion on a five-spot pattern.

A technical paper describing the process appears on page 92 in this issue of The Oil and Gas Journal. It was written by C. S. Kuhn and R. L. Koch of Magnolia's field research laboratory.

Asphalt Improvement

Rubber additive which greatly improves properties for road building appears to be biggest development in years

Gerald L. Farrar

DENVER.—Refiners may soon have the best opportunity to improve asphalt quality since the advent of steam stripping and vacuum distillation operations.

A rubber additive has been developed which, when added to the asphalt in 3 per cent concentration, will improve markedly its resiliency, impact resistance, ductility, and aging qualities. The material is expected to pay for itself in comparatively short order since costs for the additive will be in the order of 10 to 15 cents per sq. yd. per in. of thickness of hot-mix asphaltic concrete coating.

This development was released to The Oil and Gas Journal in an exclusive interview by J. R. Benson, formerly a special projects engineer of the Asphalt Institute. On August 1, Benson accepted a position with Rubarite, Inc., a company formed by Goodyear Tire & Rubber Co., National Lead Co., and Bird & Sons to market the additive.

How it's made . . . In making the new additive, barite ($BaSO_4$) is coprecipitated with unvulcanized styrene rubber, Benson said. This gives a very finely divided loose, dry powder with particle size under 5 microns, about the consistency of face powder. Composition of the powder is approximately 25 per cent by weight styrene latex and 75 per cent barites.

The additive and asphalt are mixed in the proportions of 88 per cent asphalt and 12 per cent additive, or 3 per cent rubber, he said. The additive is soluble in asphalt, and mixing is no problem. It can be blended in at the refinery or the asphalt plant as desired, and composition can be varied from batch to batch.

The use of unvulcanized styrene rubber is particularly important because of its high rate of dispersion in asphalt. Prior to the new development a semivulcanized latex was used, but cost was excessive, 35 cents per sq. yd. per in. of asphalt coating, and results were not completely satisfactory. Particle size of semivulcanized latex was +40 mesh, and lumps and aggregation occurred on mixing with asphalt, Benson said.

Due to the fineness of the powdered additive, it can be accurately metered to give precise composition control. Thus, composition of asphalt can be varied to accommodate different requirements which arise from varying load and weather conditions under which the coatings are used, he said.

Research continuing . . . Additional research on the additive is being carried out, and present indications are that concentrations lower than 3 per cent rubber may be used satisfactorily, with consequent reduction in cost, Benson revealed.

The new additive seems to be an effective peptizing agent, thus holding the various constituents in asphaltic concrete closely together. Untreated asphalts tend to lose plasticizing oils on aging. The asphalt then becomes brittle and cracks under load or changing weather conditions, he said.

Rubarite started additive manufacturing operations on July 30 at a new $1 million plant at Magnet Cove, Ark. The material is now available in 50-lb. sacks and will soon be sold in bulk quantities, Benson concluded.

CANADA

Gas Export Indicated

Evidence from long hearing expected to show Alberta with substantial gas surplus, able to ship to eastern Canada

CALGARY, Alta.—It now appears almost certain that the Alberta Petroleum and Natural Gas Conservation Board soon will declare that a substantial surplus of Alberta natural gas exists over the needs of the province.

The board currently is studying the tremendous amount of evidence accumulated during its 3-month hearing, recessed until August 24, on proposals for exporting Alberta gas east. Only two firms, Trans Canada Pipe Lines, Ltd., and Western Pipe Lines, Ltd., submitted evidence on such projects during the hearing. Application of another, Mid-Continent Pipe Lines, Ltd., is not being heard at the present proceeding, and that of a fourth firm, Northwest Natural Gas Co., was dropped.

Trans Canada is backing a line from southern Alberta north of the lakes to Ontario and Quebec. Western plans a line east to Winnipeg thence south to serve the St. Paul-Minneapolis area in the United States. Mid-Continent proposes a line to eastern Canada following a southern route through the United States, roughly paralleling the Interprovincial crude system. Northwest Natural planned a line similar to that backed by Trans Canada.

Shortly before the recess, I. N. McKinnon, chairman, said it was highly probable that the board would find that a sizable quantity of gas is now available for export. "How much the surplus will be and where it will be located cannot be indicated at the present time," he said.

In order to act on any gas-export proposal, however, McKinnon said, the board must have more and clearer evidence on "available markets and their rate of growth." To this end, he said, the board would like to have those distributing companies which would receive gas in consuming areas "state their positions more clearly and indicate what volumes of Alberta gas they are prepared to contract for and at what prices."

Pressure mounting . . . Though it is generally conceded that Alberta has sufficient surplus gas to supply a major transmission line, questions of where and by what route the line would be built appear as far from being answered as ever. This is due primarily to po-

litical complications both in Canada and in the United States.

The Canadian Government's position is that surplus gas from Alberta should not be exported until demand for the gas in Canada is met.

C. D. Howe, minister of trade and of defense production, said "once the gas leaves the borders of Alberta it comes under the electricity and fluids exportation act and its disposition must be made in the national interest of Canada as a whole."

Key members of Canada's Liberal Party now seeking reelection to the Parliament have committed themselves to support construction of a transmission line from Alberta to eastern Canada by an all-Canadian route. Such a line would be longer and much more costly than a line to the same destination through the United States south of the Great Lakes. It would, however, serve markets in northern Ontario which would not normally be served by the line traveling the southern route. This point was emphasized by Leslie Frost, premier of Ontario, in a brief filed with the Alberta board which strongly supported the all-Canadian project.

The viewpoint of E. C. Manning, premier of Alberta, on the Canadian route for the line to the east and on the issue of gas export generally is a bit different. Manning, in speaking for the Social Credit Party, said the party favors such a line only if it is economically feasible and so long as it does not unfairly penalize Alberta producers and the "people of Alberta who are the owners of the gas." If the facts prove that the Canada route is not feasible, he does not think it in any way disloyal "to insist upon a fair deal for Alberta."

U. S. complications . . . Considerable alarm has resulted among those favoring the all-Canadian line from reports that the U. S. Federal Power Commission may soon approve delivery of 22 billion cubic feet of gas annually into the Toronto area from the U. S. Southwest. The gas would be turned over to Niagara Gas Transmission Co. at the international boundary near Niagara Falls by Tennessee Gas Transmission Co. Niagara Gas Transmission is owned 35 per cent by Tennessee and 65 per cent by Consumers Gas Co., which would market the gas in the Toronto area.

The Toronto market is considered the second largest in Canada. It's loss would deal a damaging blow to any proposal for shipping Alberta gas to the eastern provinces.

The ultimate disposition of Alberta gas also is expected to be profoundly affected by Federal Power Commission treatment of an application by Westcoast Transmission Co., Ltd., to serve the U. S. Pacific Northwest (in addition to Vancouver and other British Columbia areas) with gas from northern Alberta and British Columbia. Westcoast obtained all necessary Canadian government permits in October 1952. It is the only company so far to obtain these permits for a major project. The company currently is engaged in a struggle with Pacific Northwest Pipeline Co. for an FPC permit to serve the area. The latter company would pipe gas to the Northwest from fields in Colorado, New Mexico, and West Texas.

Products Line Capacity Hiked

MONTREAL, Que.—Installation of a temporary booster station has enabled Trans-Northern Pipe Line Co. to increase capacity over part of its 442-mile products line between here and Hamilton, Ont.

The temporary station is located between the company's Montreal and Farran's Point, Ont., pump stations. The new station provides additional capacity of 14,000 bbl. daily over the part of the 10-in. main line from Montreal to Cornwall, Ont., and over the 8-in. lateral line running north 42 miles from Farran's Point to Ottawa, Ont.

When the line was opened last year its daily capacity was 40,000 bbl. per day. By adding more units, capacity on the entire line can be raised to 75,000 bbl. daily *(The Oil and Gas Journal, December 22, 1952, page 228).*

SOUTHWEST

INTEGRAL PART of Wilcox Trend Gathering System which will deliver about 100,000,000 cu. ft. of gas daily to Texas Eastern is this new 2,200-hp. reciprocating compressor station near Thomaston, Tex.

Gas Supply Bolstered

Texas Eastern, Wilcox complete interconnected 452-mile system from Hagist Ranch field in Texas to Castor, La.

SHREVEPORT. — Two major natural-gas pipe-line projects have been completed in Texas and Louisiana by Texas Eastern Transmission Corp. and its subsidiary, Wilcox Trend Gathering System, Inc.

Both Texas Eastern's new 307-mile, 24-in. transmission line from Provident City, Tex., to Castor, La., and Wilcox Trend's interconnecting 145½ miles of 16 and 14-in. main supply line, 83 miles of laterals, and 2,200-hp. compressor station were placed in operation the first part of August.

The Texas Eastern trunk line has an initial capacity of about 140,000,000 cu. ft. daily, the Wilcox Trend system a design delivery of about 125,000,000 cu. ft. daily. Capacity of the trunk can be hiked in the future to 350,000,000 cu. ft. daily with the addition of compressor stations.

The new gas supply from the Wilcox Trend area will enable Texas Eastern to replace dwindling reserves in Louisiana.

Routes . . . Texas Eastern's new line extends southwest from a connection with its 20-in. line near Castor through Bienville, Red River, and DeSoto parishes in Louisiana, and Shelby, St. Augustine, Nacogdoches, Angelina, Polk, San Jacinto, Walker, Montgomery, Harris, Waller, Austin, Colorado, and Lavaca counties in Texas to Provident City, southern terminus of the company's 16-in. line.

The right-of-way crosses eight rivers,

CONSTRUCTION of Texas Eastern line progressed rapidly during later stages this summer. Here crew lines up pipe and runs stringer bead at a road crossing near Melrose, Tex.

the Colorado, Brazos, Trinity, Neches, Sabine, Red, Angelina, and Attoyac. The Red River crossing is overhead and is under a long-term lease from another pipe-line company. All other crossings are under water and, except for the Attoyac where one 24-in. was laid, two lines, one a 24-in. and the other a 16-in., were laid under each river as a safeguard against floods.

The main supply line of the Wilcox Trend system, comprised of 68 miles of 16-in. and 77 miles of 14-in. pipe, will originate in Hagist Ranch gas field in Duval County, Texas, and extend northeast through McMullen, Live Oak, Bee, Goliad, DeWitt, and Lavaca counties to a connection with Texas Eastern at Provident City.

It will pick up gas from Hagist Ranch, Loma Alta, Rhode Ranch, Clay West and Tom Lyne, Maxine, South Karon, North Karon, Rudman and Maley, Minoak, North Minoak, West Yoward, Yoward, Goree, North Mineral, San Domingo and Strauch Wilcox, West Cosden, Dial, South Runge, Angel City and Riverdale, Nordheim, Henze, Brandt Field Extension, Meyersville, Cottonwood Creek, and North Arneckeville fields.

The field gathering system consists of about 5½ miles of 8-in., 26 miles of 6-in., 18½ miles of 4-in., and 33 miles of 3-in.

The project included a double underwater crossing of the Guadalupe River —one concrete-coated 16-in line and a 12-in. line with river weights.

Construction . . . The Texas Eastern line was laid in four sections by four major contractors: Associated Pipeline Contractors, Inc., Houston, 75 miles from Provident City to Waller, Tex.; Anderson Brothers Corp., Houston, 82 miles from Waller to Carmona, Tex.; Williams Brothers Corp., Tulsa, 71 miles from Carmona to Center, Tex.; and Trojan Construction Co. and Williams Brothers, 24 miles and 54 miles, respectively, of 78-mile segment between Center and Castor.

Contractors for the river crossings were Pentzein, Inc., for the Colorado, Brazos, Trinity, Neches, and Sabine rivers, and Williams Brothers for the Angelina and Attoyac rivers.

Construction of the Wilcox Trend main line and Guadalupe River crossing were handled by H. B. Zachry Co., San Antonio.

Altgelt Construction Co., Inc., Corpus Christi, laid the 83 miles of gathering lines.

Rank Wildcat Gets Shows

SANTA FE.—A rank wildcat 75 miles southwest of here, in an undrilled area about midway between gas fields of the San Juan basin and oil fields in southeastern New Mexico, has found encouraging shows in a deep formation.

The well is Humble Oil & Refining Co. 1 Santa Fe Pacific, 18-6n-1w, Valencia County. A 35-minute drillstem test between 10,740-10,846 ft. developed 150 ft. of slightly gas-cut mud and 120 ft. of heavily gas-cut mud with light oil stains. The formation has not been identified. Drilling continued below 10,864 ft. in black shale.

Nearest town is Los Lunas, 25 miles northeast, and nearest production is 200 miles southeast.

Lucrative Water Flood Sought

AUSTIN.—Delhi Oil Corp. is planning to double the cumulative production of its Mary C. Hubbard lease in Loma Novia field, Duval County, Texas, by water flooding.

In seeking Texas Railroad Commission permission for the project, E. C. Rach, Austin consultant for the company, said cumulative production of the lease, first drilled in 1935, was 1,910,000 bbl., or 4,000 bbl. per acre under primary methods as of June 1. He said Delhi expects to double this amount by injecting 150 bbl. of water daily per injection well under approximately 250 psi. pressure.

Oil Properties Bought

DALLAS.—San Juan Oil Co., Dallas, and Christiana Oil Co., Denver, have jointly acquired from Eby, Inc., Dallas, all properties formerly owned by Canadian Exploration Co., Denver.

Properties consist of royalty on 2,000 producing oil wells in East Texas, Old Ocean, and Anahauc fields and royalty in Katy gas field, all in Texas. Purchase price was a reported $2,800,000.

Water-Flood Permit Sought

AUSTIN.—Magnolia Petroleum Co. has asked the Texas Railroad Commission for permission to water flood nine leases in the Wichita County Regular field, estimating the program will provide additional recovery of from 1,000,000 to 5,000,000 bbl.

The nine leases involved comprise 797 acres of a field of 1,176 productive acres discovered in 1914. H. T. Hunnewell told the commission there are 44 producing stripper wells on the leases involved.

Magnolia's plan is to flood the 1,700-ft. Cisco sand (Pennsylvanian) with water obtained from 2,100 and 2,800 ft. The water will be injected on a five-spot, 20-acre pattern through a closed-type gravity system.

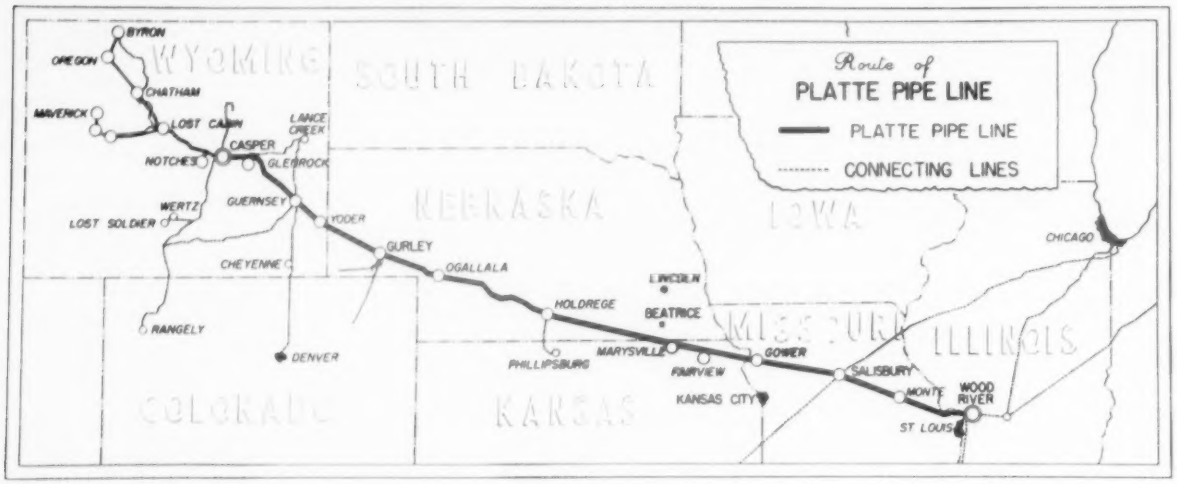
Falcon Co. Properties Sold

FORT WORTH.—Mar-Tex Oil & Gas Co., Dallas, is acquiring 43 wells in Texas and undeveloped acreage in Texas and Wyoming formerly held by Falcon Co.

The purchase, believed to involve more than $1,000,000, is being made from Park Weaver, Fort Worth, trustee for properties of former Falcon stockholders.

The purchase involves 9 wells in Slaughter pool of Hockley County, 21 in Keystone pool wells and 7 Holt lime wells in the same area in Winkler County, and 6 wells on the Newton and Ashby leases in Rusk County.

Undeveloped properties consists of 6,500 acres in West Texas and 50,000 acres in Converse and Sweetwater counties, Wyoming.



Platte Line Dedicated

Big western Wyoming-to-Wood River, Ill., crude system officially opened in ceremony August 8 at Casper, Wyo.

Gerald L. Farrar

CASPER, Wyo. — Platte Pipe Line Co.'s 1,149-mile, crude-oil system from western Wyoming to Wood River, Ill., was dedicated here on August 8. The line will be capable ultimately of delivering 150,000 bbl. daily of Rocky Mountain crudes.

The new line provides a market for the area's excess crudes at Midwest oil refineries. Present Rocky Mountain crude-oil reserves, which are in excess of 1½ billion barrels, are increasing rapidly as a result of stimulation the new line has given to exploration, development, and production in the area.

Multiple ownership . . . Five companies, Ohio Oil Co., Sinclair Oil Corp., Continental Oil Co., Pure Oil Co., and British-American Oil Co., Ltd., all active producers and explorers in the Rocky Mountains, joined to build the common-carrier line.

Dedication ceremonies for the new line were held at the main western pumping station 4 miles north of Casper. Among the speakers were Frank M. Porter, veteran western oil producer and president of the American Petroleum Institute, and U. S. Sen. Hugh Butler, Nebraska, chairman of the Senate Committee on Interior and Insular Affairs. Millard K. Neptune, president of the line, presided, and top officials of the five companies which built the line were present.

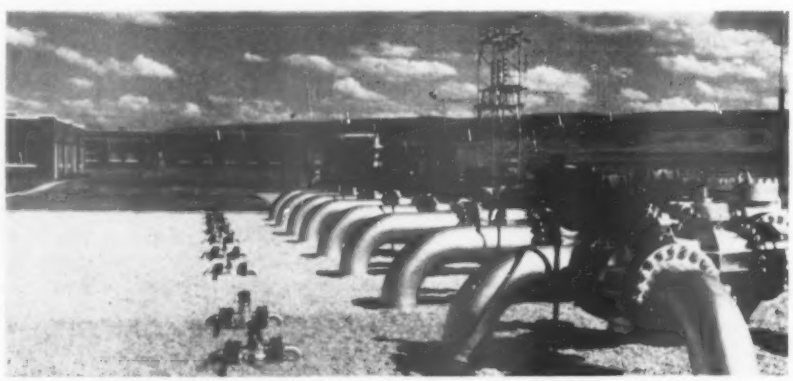
Construction of the line, Porter said at the ceremony, has been well justified not only because it has provided an outlet for shut-in oil needed for the national defense but because it also has spurred additional exploration and development in the producing areas served by the line. Exploration and development in this region, he said, currently are at record high levels and still rising.

Line route . . . The 932-mile, 20-in. main line is augmented by a 126-mile, 16-in. spur extending from Catham, Wyo., to the main station at Casper, and by 91 miles of 12 and 14-in. feeder line from the Big Horn basin to Chatham. The line has a present transportation capacity of 110,000 bbl. daily.

From the Big Horn basin of Wyoming, the line extends across Nebraska, northeastern Kansas, Missouri, and terminates at Wood River, a major refining center and junction point for connecting pipe lines to the East and North.

The main pump station at Casper is approximately a mile above sea level, thus only four pump stations are necessary to provide the line with its present delivery capacity to Wood River, about 4,500 ft. lower than Casper.

Three types of crude . . . Three types of Rocky Mountain crudes are gathered and transported in the line, and all three can be carried at one time without mixing. Injection stations are operated by Platte at six locations in Wyoming—Chatham, Pilot Butte, Notches, Casper, Glenrock, and Guernsey—and at Gurley, Nebr., and Fairview, Kans. Main-line stations are located at Casper, Ogallala, Nebr., Salisbury, Mo., and Wood River. Five delivery points are maintained on the line at Casper,

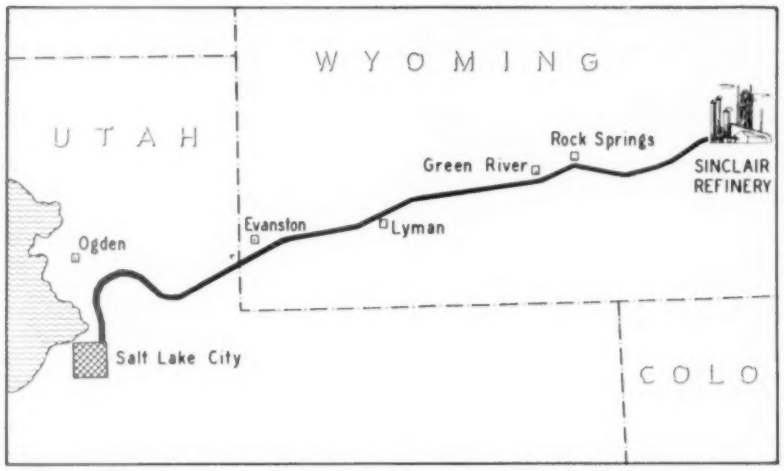


BIG VALVES in this manifold at Platte's Casper, Wyo., pump station, weigh up to 7,860 lb. and are opened and closed by remote-controlled electric motors.

Guernsey, Holdrege, Nebr., Salisbury, and Wood River.

The all-electric line boasts a 44-station microwave system which provides nine channels for instant communication along the line from Casper to Wood River and from Platte headquarters in Kansas City *(The Oil and Gas Journal, April 6, page 91)*. By means of this system, it is possible in Platte's central headquarters to read and record pressures, to start and stop motors and pumps, to open and close valves, and to determine fluid levels in tanks at remote points on the line.

Almost 2,000,000 bbl. of crude oil are required to fill the line. Crude-oil tankage totals over 2,300,000 bbl.



NEW PRODUCTS LINE from Sinclair, Wyo., to near Salt Lake City reaches maximum elevation of 7,660 ft. at the Bear River Divide east of Evanston.

Pioneer Opening Set

Ceremony dedicating 290-mile products line between Sinclair, Wyo., and Salt Lake City scheduled August 10

SALT LAKE CITY.—Pioneer Pipe Line Co.'s new 290-mile products system linking Sinclair Refining Co.'s Wyoming refinery and Salt Lake City will be dedicated August 10 in the formal opening of one of the nation's newest transportation facilities.

The 8-in. line is jointly owned by Continental Oil Co., 65 per cent, and Sinclair Pipe Line Company, 35 per cent. Near Salt Lake City it joins the Salt Lake Pipe Line Company's system serving the Snake and Boise river valley areas in Idaho and eastern Oregon and in the Columbia River basin of the Pacific Northwest at Pasco, Wash.

The new pipe-line system climbs from 6,600 ft. at Sinclair, Wyo., to 7,120 ft. at the Continental Divide near Creeson, Wyo., and reaches its maximum elevation at the Bear River Divide east of Evanston at 7,660 ft.

Construction details . . . At Wasatch, Utah, the line crosses the Wasatch Divide at 7,400 ft., and then begins a rapid descent into Lost Creek Canyon, which it follows to its junction with Echo Canyon at Devil's Slide. From here it trails the Weber River into the Salt Lake basin and on southwest to the Salt Lake terminal in North Salt Lake on the Union Pacific railroad, descending 3,400 ft. in the final 70 miles.

The largest river in the path of the line was the Green River, crossed at Green River, Wyo. Several other crossings of the Weber River were necessary as the line descended through the river canyon at the westerly end of the system.

Coating of the new line consists of 3/32-in. minimum thickness of coal tar enamel and a wrapper of fiberglass pulled into the tar with a final wrapper of kraft paper.

One pumping station . . . At present the line has only one pumping station, at the Sinclair, Wyo., terminus of the line, providing an average capacity of 12,000 bbl. per day.

Because of the 3,400-ft. fall in elevation in the last 70 miles of the line coming into the Salt Lake terminal, a back pressure of 600 psi. is necessary at the present rates of flow to prevent the separation of the liquid column at peak elevations. Under the flow rate that will exist under two-station operation, however, practically no back pressure will be required.

The station at Sinclair is electrically driven, using three 400-hp. and one 200-hp. pumping units. Two large units and a small unit are needed to pump gasoline and two of the larger units will be required for pumping distillate. This leaves the station with one full unit for standby.

Motor-operated valves are installed on the individual tank lines at the manifold so that tank changes can be made at the switchboard and at the same time main pump unit combinations changed to accommodate the gravity of the product that will be coming in. This will prevent excessive throttling and power consumption as well as excessive demand.

The Salt Lake terminal near Woods Cross is built on a 68-acre site adjacent to the Union Pacific railroad and has both truck and tank-car loading racks in addition to 500,000 bbl. of storage.

The Salt Lake Pipe Line system, transporting products from the Pioneer to terminals at Burley, Boise and Pasco, is a double 8-in. line from Salt Lake to Boise and a single 8-in. line from Boise to Pasco. One Salt Lake-Boise line is operated as a "local system" delivering all the products on this route. The second line is an "express" to Boise, making no deliveries short of this point and transporting all products delivered beyond Boise, including the terminus at Pasco.

Operating headquarters office for the Pioneer system is at the Salt Lake terminal.

New Pay Possible

Amerada gets oil in test of Devonian in Beaver Lodge

WILLISTON, N. D.—Possibilities of a new pay zone in North Dakota's first oil field—Beaver Lodge—were heightened last week by tests in a deep wildcat in the field.

On a drill-stem test in the Devonian between 10,442 and 10,500 ft., Amerada Petroleum Corp. recovered 37 bbl. of 42°-gravity crude. There was no water. The well is the 2 Lars Kvam, Tract 1, C SW NE 19-156n-95w, located 33 miles northeast of here.

A 2,500-ft. water cushion was used. The testing tool was left open 4 hours. Gas rose to the surface in 55 minutes, and after 2 hours the water cushion started to unload. There was no oil in this flow, but when the fluid was reversed out, 37 bbl. of oil was recovered in the test tank.

The test is the second drilled to the Devonian in Beaver Lodge. It lies 3 miles north and ½ mile east of Ame-

rada's 1 Clarence Iverson, which tested oil and gas in the same general zones in the Devonian in the spring of 1951 but was completed in the 8,600-ft. Mission Canyon (Mississippian) limestones to open Beaver Lodge field.

Formation markers logged in this well include the Mississippian Madison at 8,253 ft., the Devonian Three Forks at 9,850 ft., and the Devonian Jefferson dolomite at 10,050 ft., the last reported marker. The Silurian is expected to be reached between 11,550 and 11,650 ft.

Helmerich & Payne, Inc., is contractor on the well.

WEST COAST

Court Closes Wells

Gas waste blamed for shut-in of 27 Coalinga Nose wells; high-ratio wells to be penalized under allocation formula

D. H. Stormont

FRESNO, Calif. — Twenty-seven of Coalinga Nose field's 116 producers were closed for 15 days on August 2 by Superior Judge A. C. Shepard after State Atty. Gen. E. J. Brown complained operators were wasting natural gas.

The court order followed an application for a temporary injunction by the attorney general for alleged violation of the state's conservation statutes.

When the wells are restored to production August 17, they will be restricted to a 100-bbl. daily maximum until September 30. After October 20, the field's output of 45,000 bbl. daily will be allocated on a formula which will penalize high gas-oil ratio producers. Gas-oil ratios and pressure data for each well will be established by a three-man committee appointed by Judge Shepard.

All the shut-in wells are located in a "critical area" on the southwest edge of the partially unitized field. Ratios of some of the offending wells were as much as 50,000 cu. ft. per barrel, as a result of a competitive situation which has caused heavy oil withdrawals. This depletion of reservoir energy, the state claims, would result in ultimate oil recoveries being lowered by 100 million barrels *(The Oil and Gas Journal, August 3, page 40).*

Fourteen of the wells ordered shut in are in the Coalinga Nose unit. Three others are those of Pray & Walker and two are owned by Steele Petroleum Co. The remaining eight are outside the unit, but owned by companies participating in the unit and operated for them by Union Oil Co.

The three-man committee assembling the engineering data is headed by Dr. J. F. Dodge, Los Angeles consultant. The other two members are Milan Arthur, assistant chief petroleum engineer for Union Oil Co., Los Angeles, and C. H. Keplinger, Tulsa consultant.

Distribution formula . . . After gas-oil ratios for each well have been established by the committee on October 20, each producer will be assigned a well credit factor according to the formula:

$$\frac{1}{1 + 1/1{,}000\,(R - 300)}$$

when R is the average gas-oil ratio for that well, providing R is not less than 300.

Using this formula the committee will arrive at an average daily production allotment for each well based on the well-credit factor.

With a total field output of 45,000 bbl. daily and assuming that the sum of all individual well-credit factors will be 75, which is approximately the case, a well with a 1,300 cu. ft. ratio would have a credit factor of 0.5. In other words, this well would have a daily production allotment of 1/150 of the field production or 300 bbl. daily.

New Seismic Permit Granted

SACRAMENTO, Calif. — Western Gulf Oil Co.'s application to conduct seismic surveys off a 100-mile stretch of California coast line between Point Conception in Santa Barbara County and Point Dume in Los Angeles County has been approved by the State Lands Commission.

Western Gulf's application was the second to be approved by the commission recently granting permission to conduct exploratory operations in this same area. Early last month Richfield Oil Corp. received a permit to operate along the coast between Point Conception and the city of Santa Barbara, a distance of about 34 miles *(The Oil and Gas Journal, July 13, page 76).*

Western Gulf's permit will be in effect from August 15 to November 15, but initially it will cover only activity in the area above Santa Barbara.

The commission also decided to allow all companies wth seismic permits in offshore areas to set off test shots of 90 lb. of black powder within a quarter mile of the shore or of any structure (docks or other installations). Previously the limit had been a mile from any structure and a half mile from shore.

A temporary restriction on Richfield operations which prohibited exploration by the company within 6 miles of the city of Santa Barbara also was lifted.

Harbor Lease Bids Sought

LONG BEACH, Calif.—The Board of Harbor Commissioners here has agreed to call for development bids on 1,425 acres of submerged lands south of the present production in the harbor district.

Bids will be taken on the entire acreage or on two individual parcels, one totaling 875 acres and the other 550 acres. Chief Petroleum Engineer Frank Hardesty stated that about 500 acres in the area are believed to contain between 15,000,000 and 20,000,000 bbl. of oil.

Bids will be on a cost-plus type contract, similar to the ones held by Richfield Oil Corp. and Long Beach Oil Development Co., and will run for 11 years.

Firms Enter Drilling Deal

SANTA BARBARA, Calif.—Monterey Oil Co., Los Angeles, has agreed to carry out drilling and producing operations on about 240 acres owned by Palmer Standel Oil Corp. in East Cat Canyon field, Santa Barbara County.

The property is located in the west half of the southwest quarter of Section 29, the south half of the northeast half, and the east half of the southeast quarter of Section 30-9n-32w.

Presently, there are 13 shut in wells on the property. Monterey will recomplete some of these wells and drill others until there is at least one well for each 10 acres. The company plans to put down a new well every 90 days, or recomplete an old well every 60 days.

Under the agreement, Palmer Stendel is to hold a one-sixth royalty interest.

What Congress Did

A lot of laws affecting oil were passed, but a lot more were left hanging for the next session opening in January

Bertram F. Linz

WASHINGTON.—Congress enacted more laws affecting the oil and gas industry than is generally realized during the session just ended, but left almost as many on the program for consideration next year.

From the industry's standpoint, the most important actions of the 1953 session probably were the final removal of all emergency price and material controls and the enactment of measures returning the "tidelands" to the coastal states and paving the way for development of the outer Continental Shelf under a federal leasing system.

Financially, the industry got a jolt in the extension of the excess-profits tax for an unexpected 6 months but was assured the levy would not be continued after next December 31. But next year Congress will enact a general revenue measure which may include some change in the percentage-depletion deduction and substitute a general manufacturers' sales tax for the many excise levies now applied.

In another revenue measure, Congress ended the long-standing exemption from income tax of all pay of American citizens working abroad but permitted the exemption of up to $20,000 of such income, which it is believed will relieve most oil company workers in foreign operations from the domestic tax.

Quit-business boom . . . During its first 6 months in office the Eisenhower administration made a good start on getting the Government out of business.

The Navy Department, with congressional approval, abruptly terminated its multimillion-dollar exploration for oil in Alaska and dropped plans for extending operations in the Teapot Dome (Wyoming) reserve.

The Commerce Department sold its Mississippi River barge line for some $9,000,000. Congress ordered the closing of the synthetic liquid fuels demonstration plant operated by the Bureau of Mines at Louisiana, Mo., and instructed that the facilities be sold, and deferred until next year proposed legislation expanding government activities in the synthetic-fuels field, although giving the bureau some $4,000,000 for continued experimentation.

Congress also paved the way for sale of the Government's synthetic-rubber plants under terms which were not satisfactory to all interests but which an informed government official said will be workable. Oil companies now operating government-owned rubber plants are expected in several instances to try to buy them.

Imports . . . Vigorous efforts by coal and railroad interests to secure the imposition of a quota on foreign-oil imports were unsuccessful but they may have better luck when the matter comes up again next session, when the results of a study recommended by the President are in and the administration makes recommendations for revision of the Reciprocal Trade Agreements Act.

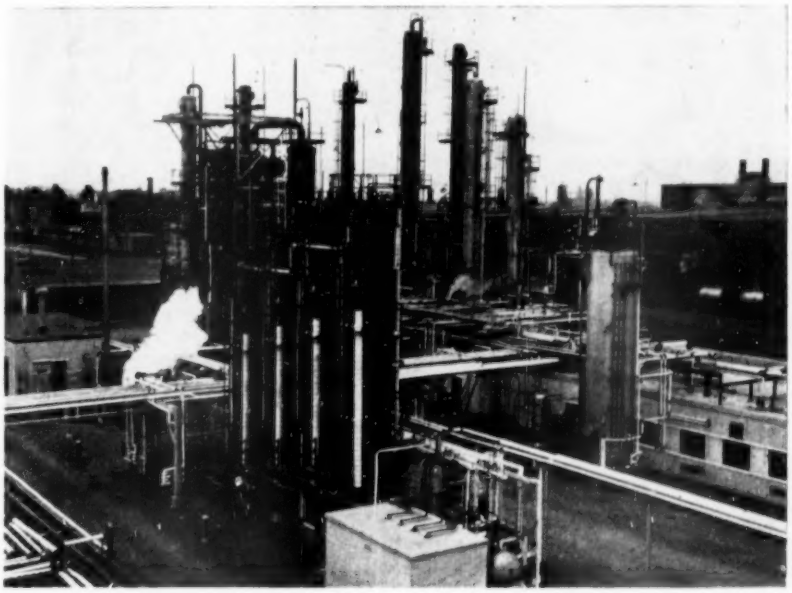
Meanwhile, the act has been extended for 1 year from last June 12. Next year's legislation also may be influenced by the results of an investigation just started by a Senate interior subcommittee headed by Sen. George W. Malone of Nevada into the question whether the Western Hemisphere could be self-sufficient in petroleum supplies.

Although extensive hearings were held, no bills were reported for revision of the Taft-Hartley Labor Relations Act. This was one of the measures on the administration program, and action next year has been assured.

Tankers . . . Congress also failed to complete action on legislation to encourage the construction of more modern tankers and establish a reserve tanker fleet for use in the event of war.

The bill, urged by the administration, would permit the Secretary of Commerce, over a 5-year period, to acquire title to any tanker more than 10 years old and place it in the reserve fleet, the tanker owner to be given a credit toward the purchase of new tankers which would contain certain national-defense features.

Commerce Secretary Sinclair Weeks, recommending the legislation, said that recent comprehensive studies of petroleum needs of the United States and the free world disclosed that one of the most serious risks to the national se-



Montreal Petrochem Plant First of Its Kind

THIS $4,000,000 PLANT of B.A.-Shawinigan, Ltd., at Montreal, is the first of its kind in the world to synthesize phenol and acetone from cumene. British American Oil Co., Ltd., is alkylating benzene and propane-propylene mixture to produce cumene at the company's 45,000-bbl. per day refinery, visible in the background. The cumene is transferred to the B.A.-Shawinigan petrochemical plant where it is oxidized and split into phenol and acetone. The process, developed by Hercules Powder Co. in the United States and Distillers Co., Ltd., in England, is the first of its kind to reach commercial application. The plant was constructed by Canadian Kellogg, Ltd., an affiliate of M. W. Kellogg Co.

curity in the event of a grave national emergency stems from the prospective shortage of tankers.

Under existing law, the Government may accept vessels over 12 years old in exchange for credit in the construction of new ones. Since the major part of the present tanker fleet was built during World War II the vessels are not 12 years old and are ineligible for trade-in. By dropping the age limit to 10 years almost the entire fleet could be replaced with new, faster, and more efficient tankers, Weeks said.

Among the other measures enacted during the session were the following:

...The Interior Department requirement that natural-gas pipe lines crossing public lands be classed as common carriers was revoked.

...Mining claims for fissionable materials on public lands covered by oil and gas leases were authorized.

...A new Small Business Administration was established to take over most of the functions of the Reconstruction Finance Corp. and Small Defense Plants Administration, which are abolished.

...There was no action on legislation to write into law the Supreme Court decision in the Standard Oil Co. (Ind.) case that a showing of "good faith" is an adequate defense against charges of prices discrimination under the Robinson-Patman Act. However, this and other phases of the antitrust laws may come up for consideration next year as a result of a complete study of the monopoly statutes recently initiated by Atty. Gen. Herbert Brownell, Jr.

...The House approved a measure defining the conditions under which the Interstate Commerce Commission could amend, suspend or revoke water carrier certificates, including those for oil-carrying barge lines, but the Senate Commerce Committee, whose work was interrupted last month by the sudden death of Chairman Charles W. Tobey of New Hampshire, put the matter over until 1954.

Measures not taken up during the session included a Defense Department request for permission to make long-term charters, up to 20 years, of oil tankers, a proposal for creation of a new agency on minerals and petroleum to take over the activities of the Interior Department in those fields, and the Heselton bill for well-to-pump federal control of the oil industry.

The 1954 session of Congress is scheduled to open January 6, but a special session this fall to raise the national debt limit is a possibility. The special session, however, would be limited to the one subject, barring an unforeseen emergency.

WATCHING WASHINGTON

Bertram F. Linz

G.O.P. Weathers Storm

The first session of the Republican-controlled Eighty-third Congress accomplished a lot more than is generally realized.

From the standpoint of issues which make good newspaper headlines President Eisenhower didn't get all of his program through in the 6 months in which his party had control. But a lot of legislation was enacted which, while not of earth-shaking importance, will have considerable effect upon various segments of the economy.

While the big news from the standpoint of the oil and gas industry was the legislation dealing with the tidelands and the Continental Shelf, several other measures dealing with oil and gas were enacted with respect to operations on the public lands.

Coming into power after a 20-year exile, the big problem of the Republicans in Congress was to accustom themselves to being on the defensive. Much of Eisenhower's difficulties in lining up support for his program arose from the fact that many Republicans were so accustomed to attacking the administration that they couldn't break the habit. Nevertheless, if the President didn't accomplish all he set out to do he did get enough of his program through to satisfy most people that he was in there trying.

Congress may be called back in the fall to raise the debt limit, and after consultation with their constituents this summer a lot of congressmen may return more amenable to party discipline, knowing that if they don't pull together from then on they may be looking for jobs in late 1954.

Tempest in an Oil Can

The sharply critical investigation of oil prices by the House Committee on Interstate and Foreign Commerce brought out a lot of allegations and a lot of facts but didn't bring about a revolution.

When the committee started out to explore the increases in prices everything appeared to be in its favor. Nobody likes high prices, particularly if he has to pay them and the committee heard a lot about high prices from consumers.

When the oil industry presented its case, showing that it alone of all industries had gone through the latest inflation period without increasing its prices, all the fun evaporated. Like it or not, committee members most vehement against price increases had to swallow the cold facts of steadily increasing costs of finding, producing, refining and transporting oil, particularly when those facts showed that the industry's price increases only partially compensated for the greater expense.

The investigation is over, and in thinking quarters it probably helped rather than hurt the industry. So far as the general public is concerned it was just another tempest in an oil can.

Same Deal, New Agency

What started out in 1948 as the Marshall Plan is in the midst of its third incarnation.

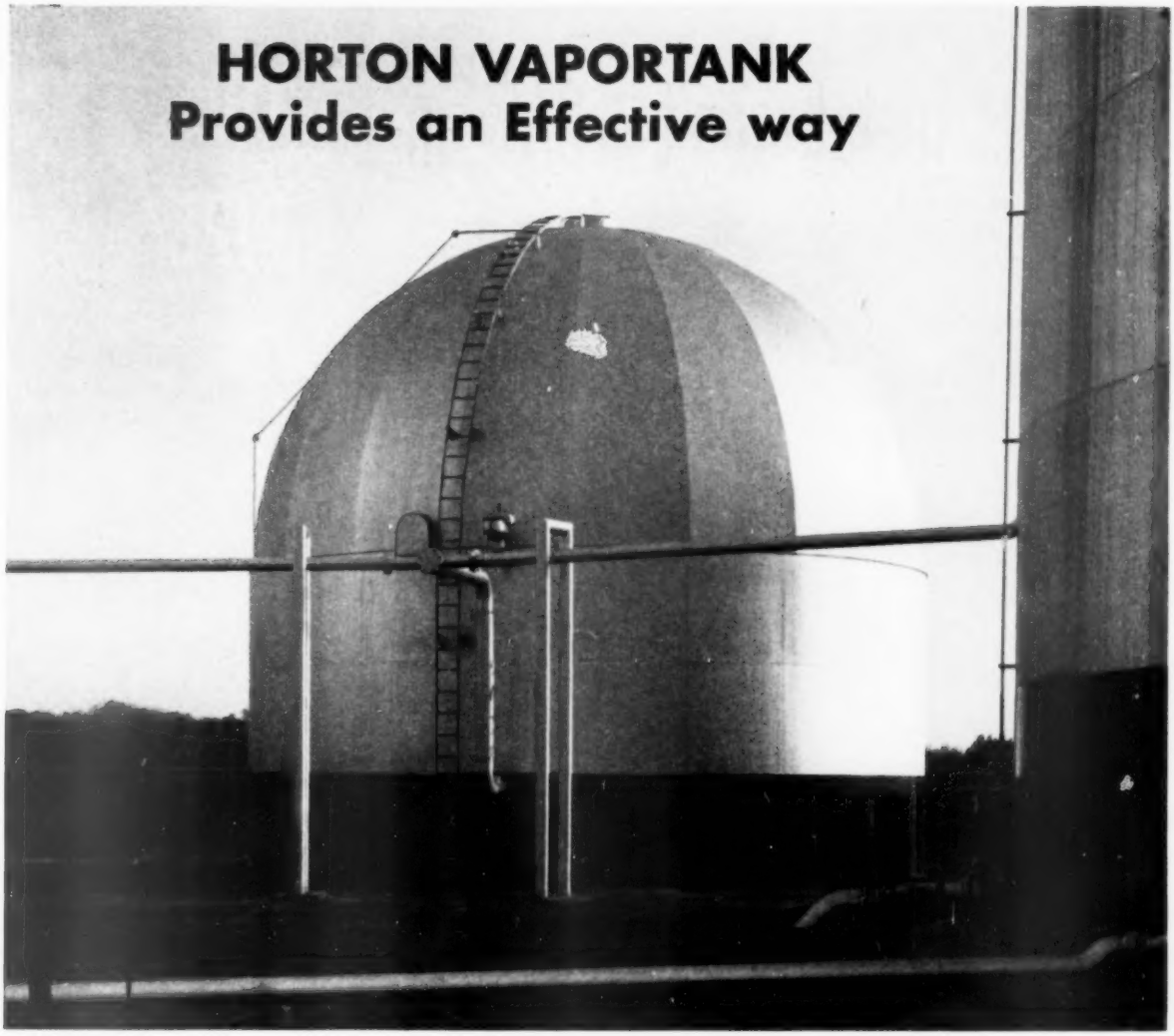
Designed originally to help war-ruined Europe get back on its feet, the program for American financing of the oil, food, and other needs of more than a dozen European countries, including rebuilding and expansion of their refining and other vital industries, was administered by the Economic Cooperation Administration.

As Europe revived and subsistence aid gave way to its military expansion, the ECA became the Mutual Security Agency. Expansion of crude production in the Middle East and the completion of vast refining programs for its utilization in Europe, reduced the requirement for American financing of oil imports.

The current foreign aid program is aimed almost entirely at building up the military defense of the democratic nations of Europe, and the MSA has become the Foreign Operations Administration.

Basically, the FOA is the same organization that started out 5 years ago. Its name has changed twice, as have its programs and objectives, but this has been accomplished without any disruption of organizational structure.

HORTON VAPORTANK
Provides an Effective way



. . . to reduce evaporation losses from fixed roof tanks

The best way to reduce evaporation losses when volatile hydrocarbons are stored in fixed-roof tanks is to install a vapor-saving system. The Horton Vaportank, ideal for this service, consists of a cylindrical shell with a dome top and flat bottom. A flexible, hemispherical membrane is attached, by its outer edge, to the top of the straight portion of the shell. As expansion takes place in the vapor spaces of the tanks storing liquids, or filling occurs, the membrane rises to make room for the increased vapor volume or vapor displaced by liquid. When conditions causing the displacement are reversed, the vapor returns to the tanks.

The 25,000-cu. ft. Horton Vaportank shown above was built for the Union Oil Company of California at its Ventura Terminal. It is connected to two gasoline tanks. Average throughput for each of the tanks in the Vaportank system is 350,000 gals. per month.

Supervision of Field Welding

A CB&I Field Welding Supervisor checks procedures and workmanship on every welded structure we build. We provide this service to assure you that every tank we erect is in accordance with the governing specifications. This complete CB&I Field Welding Supervisory Service is provided at no extra cost.

Quotations on any Horton steel plate structures may be obtained by writing our nearest office. There is no obligation on your part.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3	2154 Healey Bldg.	Detroit, 26	1514 Lafayette Bldg.	Philadelphia, 3	1615 1700 Walnut Street Bldg.
Birmingham, 1	1536 North 50th St.	Havana	402 Abreu Bldg.	Pittsburgh, 19	3228 Alcoa Bldg.
Boston, 10	1025-201 Devonshire St.	Houston, 2	2119 C & I Life Bldg.	San Francisco, 4	1554 200 Bush St.
Chicago, 4	2128 McCormick Bldg.	Los Angeles, 17	1523 General Petroleum B'dg.	Seattle, 1	1325 Henry Bldg.
Cleveland, 15	2201 Midland Bldg.	New York, 6	3347 165 Broadway Bldg.	Tulsa, 3	1606 Hunt Bldg.

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Comprimo, N.V., 21, Amstel, Amsterdam (C), Netherlands
Campagnia Tecnica Industria Petroli, Rome, Italy
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Uniformly beveled ends of Armco Pipe simplify and speed field welding. Even here, the excellent weldability and ample ductility of Armco Pipe protects you against costly delays. Your job hurries along at every step.

These are money-in-the-pocket reasons for considering Armco Steel Pipe for gathering systems, line pipe and wherever else you need dependable oil and gas conduits. Write for complete data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1503 Curtis Street, Middletown, Ohio. 201 KOME Building, Tulsa, Oklahoma. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

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ARMCO WELDED STEEL PIPE

Shelf Drilling Due

Enactment of federal law providing for administration of offshore lands expected to act as spur to Gulf activity

WASHINGTON. — Development of the oil, gas, and sulfur deposits underlying the Gulf of Mexico may be started within a matter of weeks by companies whose operations under state leases have been held up for years by the controversy over the ownership of the submerged coastal lands.

Well before the end of the year, the Interior Department is expected to issue the regulations under which additional leases may be acquired. Intensive exploration is expected to be conducted not only off the coasts of Texas and Louisiana but off the west coast of Florida as well.

The green light for these operations was given by Congress in the closing days of the session when it enacted legislation for the administration of the resources of the Continental Shelf beyond the boundaries of the coastal states.

Earlier in the year Congress made good on President Eisenhower's election promise to return to the states the full control of waters and resources out of their historical seaward boundaries.

There was no controversy over federal ownership of the Continental Shelf beyond state boundaries and no further impediments to development are expected to arise.

State laws may apply . . . Under the legislation finally written by Congress, the jurisdiction and control of the federal Government is extended to the seabed and subsoil of the entire outer Continental Shelf and to all artificial islands and fixed structures such as drilling platforms that may be erected for purposes of development.

To the extent that the laws of adjacent states are not inconsistent with federal statutes and regulations they will be adopted as federal laws. The state laws will apply to the areas as if their boundaries were extended seaward to the outer margin of the Continental Shelf.

A specific provision of the new law bans the extension of state taxation laws.

Suits and controversies arising on the outer Continental Shelf are to be handled by the United States district courts.

The administration of the area will be under the control of the Secretary of the Interior, who will not only establish the regulations for development and issue leases but also is authorized to grant rights-of-way for pipe lines.

In the case of gas lines the Federal Power Commission has jurisdiction. In the case of oil lines the Interstate Commerce Commission is authorized to determine the conditions of transportation. These will include a requirement that the pipe lines transport or purchase without discrimination the oil or gas produced in their vicinity in such proportionate amounts as the commissions may determine after hearings.

Old leases honored . . . Leases issued by the states prior to December 21, 1948, which would have been in effect on June 5, 1950, the date of the Supreme Court decisions in the Texas and Louisiana cases, will be honored by the federal Government if they meet certain standards.

These standards require that the lease will continue to be subject to the overriding royalty obligations existing on the effective date of the act; that it was not obtained by fraud or misrepresentation; that, if issued on or after June 23, 1947, it was issued upon the basis of competitive bidding; that it provides for a royalty of not less than 12½ per cent on oil and gas or 5 per cent on sulfur; that rents, royalties and other sums due under it between June 5, 1950, and the effective date of the act be paid up; and that payment be made for severance, gross production or occupation taxes imposed by the state issuing the lease on all production between June 5, 1950, and the effective date of the act, and such payments are to continue on production under federal management.

All leases issued by the Secretary of the Interior under the new law are to be on the basis of sealed bids.

Leases are to cover compact areas not exceeding 5,760 acres, and are to run for 5 years and as long afterward as oil or gas is produced in paying quantities or drilling or well reworking operations are conducted. The minimum royalty is fixed at 12½ per cent for oil or gas and 5 for sulfur.

Treasury gets revenue . . . All revenues from the Continental Shelf are to go into the Treasury as miscellaneous receipts. Efforts to earmark them for aid to education or other specific purposes were disapproved.

Other sections of the act authorize the President to withdraw any unleased lands of the outer Continental Shelf from disposition.

In time of war, or when the President shall so designate, the United States is to have right of first refusal to purchase at the market price all or any portion of any mineral produced from the area.

All leases will contain a provision allowing the Secretary of the Interior to suspend operations under any lease during a war or a national emergency, and compensate lessees whose operations are suspended.

The Government reserves the right to designate as areas restricted from exploration and operation any part of the outer shelf needed for national defense and compensate any lessees involved.

The Government also reserves the ownership and right to extract all helium contained in gas produced from any portion of the outer shelf.

The new law will be known as the "Outer Continental Shelf Lands Act."

Digby To Join FPC

New commission member regarded as conservative

WASHINGTON.—Seaborn L. Digby, former Louisiana state district judge and from 1948 to 1952 a member of the Louisiana Conservation Commission, has been confirmed by the Senate as a member of the Federal Power Commission.

Digby will succeed Harrington Wimberly as a Democratic member of the commission. The new commissioner holds some oil and gas stocks which he will dispose of before taking office some time within the next few days.

Digby was a supporter of Adlai Stevenson in the last presidential campaign. His selection for the FPC post, however, was strongly supported by Governors Shivers of Texas and Kennan of Louisiana, both Eisenhower supporters, and by a number of influential men in the oil and gas industry.

There was nothing surprising in the selection of a Louisiana Democrat for the post. Under the law, not more than three of the five members of the commission can belong to the majority party, and the present administration is attempting to fill as many posts as possible with men who know something about the subjects they will have to deal with. Digby is represented as believing strongly in private enterprise, and is seen in Washington as being a conservative influence.

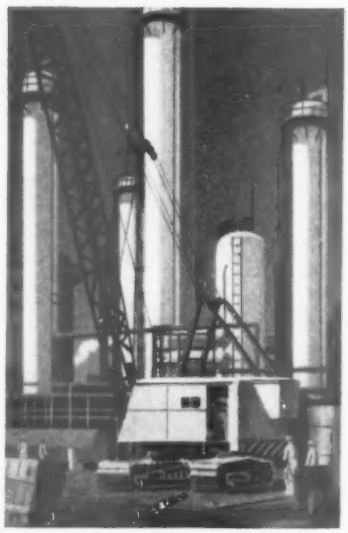
Celanese creates new horizons for industrial chemistry

The rapid rise of Celanese Corporation of America from an obscure beginning to its current unique position, typifies the success saga of American business. In more than a casual sense, the Celanese story is that of the world's chemical plastics and textile industries. As a result of its infinite drive for perfection, the American people of every economic level are better dressed than any other nation of the world.

Celanese Corporation's integration program embraces affiliates in Europe, the Orient, Latin America, and extensive expansion of already vast operations in Canada and the United States.

On the domestic front, Celanese is enlarging its scope in the production of raw materials for the chemical, plastics and petrochemical fields, and developing fibers to put new emphasis on industrial synthetics.

Brown & Root feels signally honored to have been selected to design, engineer, and construct plants in three different nations, for Celanese Corporation of America. This is another example of the greatest names in American industry benefiting from Brown & Root's extensive experience in process engineering and construction.



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INDUSTRY AFFAIRS

Biggest Tanker

Greek firm receives first of three 45,000-ton giants

THE rank of the world's largest tanker has passed to a giant 45,000-deadweight ton vessel launched recently for Greek shipping interests in Hamburg, Germany.

The vessel is the latest development in the postwar trend toward construction of super-sized oil tankers. It is half again as large as the so-called supertankers of about 30,000 tons which have been built in increasing numbers the last few years.

The new tanker is the Tina Onassis and is the first of three vessels of the same class which are being built at the Howaldtswerke shipyard in Hamburg for Olympic Transportation Co. Its carrying capacity will be about 315,000 bbl. The ship is 775 ft., 8-in. overall in length, 95 ft. in beam, and has a depth of 51 ft. and a draft of 37 ft. Steam turbines develop 17,500 hp. for the single screw, and a 16-knot speed is expected.

In size, the Tina Onassis not only exceeds the present world's largest tanker by about 7,000 tons but it also ranks as the world's sixth largest merchant ship of any kind. Only larger ships are five passenger liners, The United States, Queen Elizabeth, the Queen Mary, Liberte, and Ile de France.

The new tanker is scheduled to be delivered in October, one year after the commencement of construction.

Penn Grade Price Raised

BRADFORD, Pa. — Increases in prices of Pennsylvania Grade crude, ranging from 13 cents to 15 cents a barrel, have been announced by the Joseph Seep Purchasing Agency of South Penn Oil Co.

The new postings, effective August 3, raised Bradford district crude, delivered to lines of either Bradford Transit Co. or National Transit Co., to $4.55 per barrel. Middle district crude in National Transit lines was increased to $4.55. The increase for both districts amounted to 15 cents a barrel.

Southwest district crude was raised 14 cents a barrel to $4.11. West Virginia crude in Eureka Pipe Line is up 14 cents to $4.05 Pennsylvania Grade crude from Ohio, delivered to Buckeye Pipe Line, is now posted at $4.04 a barrel for an increase of 13 cents.

The last increase for Pennsylvania Grade crude was 15 cents a barrel, effective February 16 of this year. Bradford district crude at $4.55 is still 45 cents under the 1948 posting of $5.00 a barrel.

Sinclair Grants Wage Hike

NEW YORK.—A 4 per cent pay increase, a pattern currently being followed by the larger companies in the industry, is provided in a new contract between Sinclair Oil Corp. and the Oil Workers International Union (C.I.O.).

Millard E. Stone, Sinclair's director of industrial relations, said the increase was effective July 1 on straight-time base rates of pay. The new contract, covering some 10,000 Sinclair employes represented by the union, runs from August 1, 1953, to July 1, 1954.

The contract, which is subject to ratification of the union members, extends previous terms of employment through the contract period.

Sinclair is the last of the major companies to sign a contract granting the increase. The 4 per cent increases average about 9 cents an hour per employe.

Geology Seminar Planned

AUSTIN.—Some of the nation's outstanding geologists and petroleum industry leaders will be guest lecturers this fall at a University of Texas graduate seminar on the technical and ethical aspects of careers in geology.

Edgar W. Owen, San Antonio, former president of the American Association of Petroleum Geologists, will direct the seminar. Speakers will include L. F. McCollum, Continental Oil Co. president; L. T. Barrow, Humble Oil & Refining Co. board chairman; E. L. DeGolyer, geologist; F. H. Lahee, former Sun Oil Co. chief geologist; Wallace E. Pratt, retired vice president of Standard Oil Co. (N. J.), and a number of noted educators.

Industry Briefs

MARTINEZ, Calif.—Shell Oil Co. announced last week a 4,500-bbl. Platforming unit will be erected at its 55,000-bbl. refinery here. The contractor, C. F. Braun & Co., expects to begin work on the $1,700,000 unit immediately and have it in operation by July 1954.

AUSTIN.—Stanolind Oil & Gas Co. is seeking permission from the Texas Railroad Commission to create a 100,000-bbl. L.P.G. storage reservoir in an underground salt section in Andrews County. Company officials plan to circulate fresh water from their South Fullerton gasoline plant in the salt section from 1,800 to 2,300 ft. and dispose of the brine from the leaching process in the Santa Rosa formation.

SHREVEPORT.—Sunray Oil Corp. is constructing a cycling plant in the 14-well South Sarepta gas-distillate field in Bossier and Webster parishes, Louisiana. The field was unitized and closed in last February by the Louisiana Conservation Commission. Presently, Sunray is drilling four additional wells to establish the boundaries of the field.

GULF COAST

Weeks Island Record Set

FRANKLIN, La. — A new drilling depth record for Weeks Island field in Iberia Parish, coastal Louisiana, has been set by Shell Oil Co. with its 2 Gonsoulin-Minville State Unit.

This test passed the 17,404-ft. mark on August 1, thus breaking the previous depth record for the area set by Humble Oil & Refining Co.'s 1 Hortense Gonsoulin, which was drilled to 17,403 ft. and completed in an upper section of the lower Miocene.

Shell already has the world's deepest commercial production at Weeks Island, in its 1 Weeks Gall Unit, which was completed in March as a gas-condensate well through perforations from 17,039-17,122 ft. in the Miocene *(The Oil and Gas Journal, March 30, 1953, page 56).*

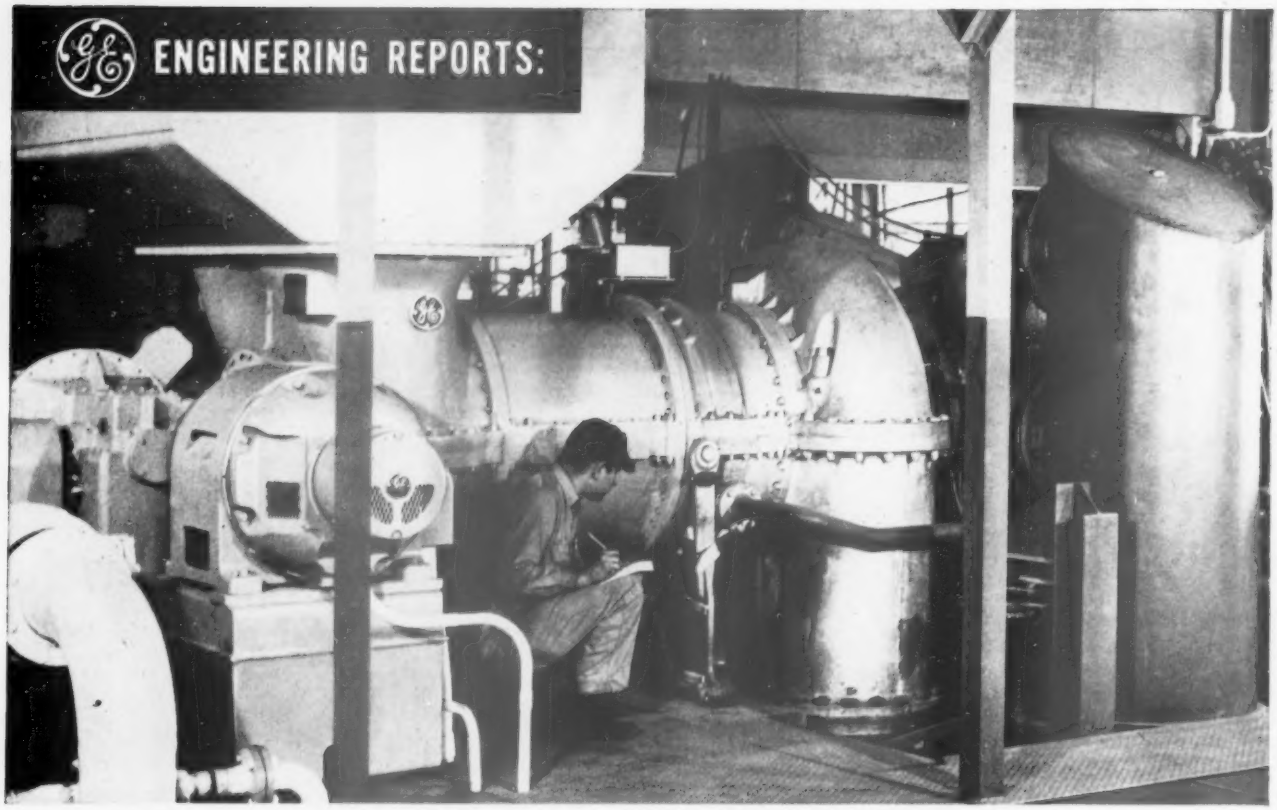
Improved drilling techniques by Shell engineers have resulted in faster rate of penetration, enabling the company to drill the 2 Gonsoulin to present depth in a little more than 90 days. The company plans to drill to at least 18,000 ft.

Pollution Suit Threatened

HOUSTON.—A civil suit, in the form of a request for an injunction, probably will be brought against operators of chemical plants in the east Houston area who are allegedly polluting the air.

A Harris County official is conferring this week in Austin with the state attorney general and Texas Department of Health regarding the problem. The county official's conference with state authorities was requested by Harris County Judge Robert Casey.

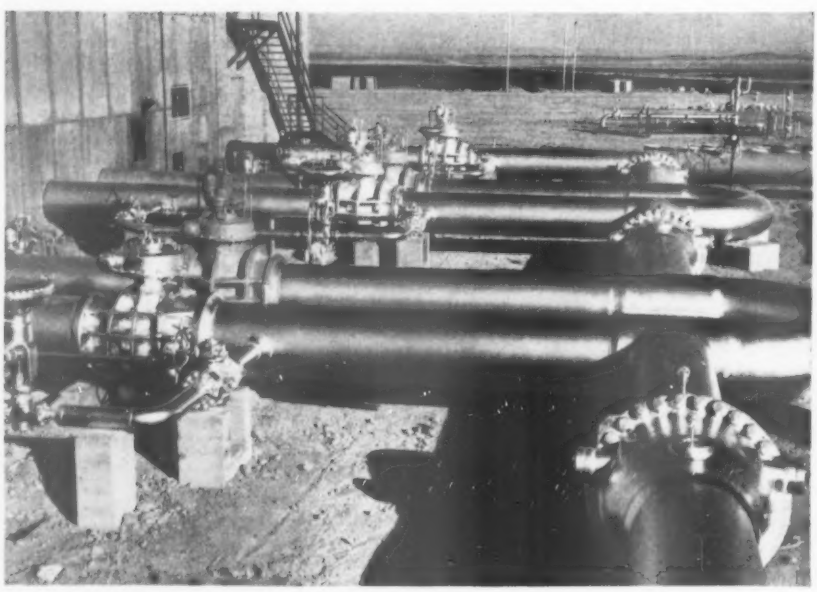
ENGINEERING REPORTS:



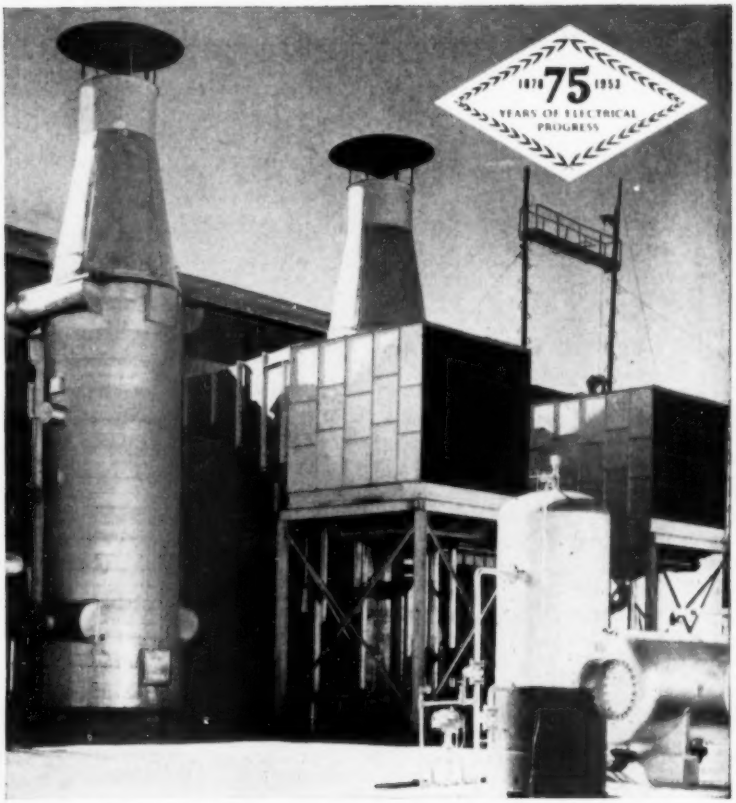
This G-E gas turbine is the first of 28 installed for gas pipeline pumping by the El Paso Natural Gas Co.

El Paso reports performance of G-E

NO OUTSIDE POWER IS NEEDED—panel above provides control for station auxiliaries. Auxiliary generator, driven by the turbine, provides all a-c power while turbine is operating.



MAIN GAS PIPING is simplified by use of gas turbine-driven centrifugal compressors. The suction and discharge valves, purging and pressurizing valves are all controlled automatically on start. The G-E gas turbine is automatically loaded, and the station discharge pressure is maintained automatically.



HIGHER EFFICIENCY—regenerators "recapture" waste heat, enable turbines to pump with efficiencies comparable to other types of power plants.

gas turbines exceeds expectations

Records of first 15 combustion gas turbines used for pipeline pumping show they start fast, save fuel, simplify operation

So far, El Paso Natural Gas Company has put 15 General Electric combustion gas turbines into operation on their cross-country gas line. Performance has been carefully watched. El Paso has found:

1. **Stations start in 19 minutes—automatically.** Station batteries and pipeline pressures do it all.
2. **Five-man crews can operate stations.** The simple construction of the turbines means reliable performance, easy operation, less maintenance.
3. **Operation proves turbine flexibility.** During nine months of operation under fluctuating conditions, the turbine at Cornudas Station performed with even greater flexibility than had been predicted.
4. **Personnel training system is highly satisfactory.** Key El Paso personnel were sent to the G-E gas turbine plant for intensified training. They in turn trained regular operating staffs. All new positions have been filled by company personnel.

G-E system engineers will be working closely with El Paso engineers during installation of the 13 combustion gas turbines still to go on the line. Your G-E Apparatus Sales Representative can tell you more about their services—and about the G-E gas turbine. Ask him also, to arrange for a showing of the new full-color film, "The El Paso Story," or write to General Electric Company, Schenectady 5, New York. 661-4

Combustion Gas Turbines for the Gas Pipeline Industry—Backed by 45 years of Turbine Leadership

GENERAL ELECTRIC

EUROPE

Soviets Offer Oil

Listing of crude as commodity for barter with western nations indicates Russian supply is no longer critical

Dahl Duff

RUSSIAN-PRODUCED oil is being offered on the market in Western countries with increasing frequency.

In half a dozen or more trade agreements negotiated or discussed during the last few months, the Soviet Government has listed oil as one of the commodities it is ready to supply.

The significance of this development is not clear. Industry officials doubt that it represents any concerted effort by the Communists to regain an important place in the international oil trade such as they held 25 years ago.

One conclusion that can be drawn is that Russian oil supply is not as critical or as desperate as some were inclined to think a year or two ago. Russia is now believed to be producing well over a million barrels daily and has pushed output from the Austrian fields, which it controls, up to 60,000 bbl. daily or more.

Latest indications of Russian oil output were given in an economic progress report released in Moscow in mid-July. This declared that the oil industry had slightly outstripped its planned goal and that crude-oil production during the first half of 1953 was up 11 per cent. The long-term Soviet goal calls for 60,000,000 tons, or more than 1,200,000 bbl. daily, by 1955.

In the Russian economy, civilian oil consumption is relatively minor in comparison to countries of the Western world. The oil burners and automobiles which provide the major part of the market in the United States are not found in the Soviet Union. Russia is the third largest oil-producing country of the world, after the United States and Venezuela, but its output is channeled to essential industrial uses and the military. Some observers believe the Soviets have built up large military oil stockpiles and that consequently any excess production can now be directed toward barter deals with the West.

Oil for strategic materials . . . This is particularly true in those cases where the Russians in turn obtain badly needed or strategic material from Western countries. Russia and France signed a 3-year trade agreement last month for the exchange of about $70,000,000 worth of goods. The Russians promised to supply crude oil along with asbestos, chrome, and manganese. All four of these commodities are listed in the U. S. Battle Act which bans their export behind the Iron Curtain. Russia's offer to ship the same materials has the effect of discrediting United States policy.

Some details were reported recently on the Russian-Argentine trade agreement under negotiation. Russia agreed to provide a half a million tons of oil—about 2,000 bbl. daily if spread over a year's period—along with manufactured goods, including oil-drilling equipment. The amount of oil offered represents only a fraction of Argentina's total requirements.

Early this summer, Russia made bids to several independent Japanese companies to furnish oil from Sakhalin. The Soviets in return wanted mainly Japanese-built fishing boats and equipment along with boat-repair services, and were said to be ready to provide oil from the Baku region if the Sakahlin production were not sufficient. Sakahlin is reported to have a production of about 20,000 bbl. daily, and the reports said Russia was ready to supply 10,000 to 12,000 bbl. daily to Japan.

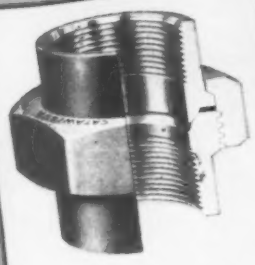
The Russian proposals were taken under consideration by the government in Tokyo. There are no diplomatic relations between Japan and Russia since the Soviets never ratified the peace treaty. The Russian offer to several private Japanese companies came about the same time that the Japanese Government was seeking to avoid antagoniz-

Formal Opening Set for New Refinery

A major new addition to the refining facilities of continental Europe will be formally opened September 8 at Antwerp, Belgium. It is the 25,000-bbl.-daily plant of Esso Standard Refinery, S.A., an affiliate of Standard Oil Co. (N. J.). The refinery, which cost $25,000,000, is situated on a 190-acre site along the Schelde River and includes latest-design fluid catalytic cracking equipment, integral docks for tankers, and facilities for direct delivery of bunker fuel to ships. Major features of the refinery were described in an article in The Oil and Gas Journal, January 19, page 115.

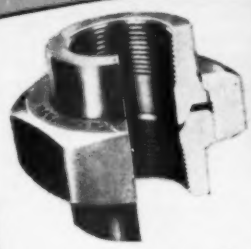
Catawissa Unions and Check Valves...

for greater operating efficiency and economy in every oil-field service



CATAWISSA NO. S-1A

The hot-forged steel union with heavy, coarse ACME threads in the union nut for quick make-up or disconnecting in the field.

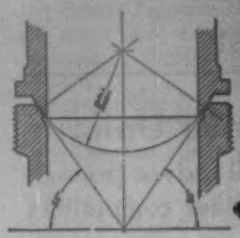


CATAWISSA NO. S-1

Hot-forged steel unions with U. S. Standard V-Threads in the union nut are recommended for general oil-field service.

CATAWISSA NO. 502 CHECK VALVE

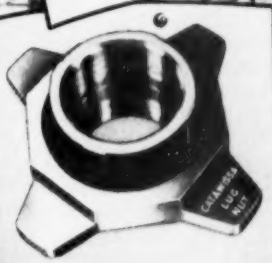
Accessible, efficient, economical, Catawissa Double Union Swing Check Valves are full opening and are furnished with union connections on both ends, eliminating the union and nipple necessary to install the regular type check valve. They are the flow-line type designed for use where no stop is installed close to the check valve.



BALL-TO-ANGLE SEAT

CATAWISSA NO. L-1A

This union is furnished with a 2-lug nut which can be applied with either a hammer or wrench. The triangular shape eliminates distortion or breaking. Designed with coarse ACME threads for general service on drilling rigs and all piping purposes where quick make-up is desirable. Available in standard and double extra heavy weight. Sizes 1" to 3" inclusive.



CATAWISSA NO. L 1-4A

Made in 4-inch size with four lugs on the nut.

"OILWELL" store and warehouse points are stocked with a complete line of Catawissa forged-steel unions and check valves. These Catawissa products are designed and recommended for the rough-and-ready demands of any oil country application.

NOTE THESE IMPORTANT FEATURES

HOT-FORGED . . . from solid, rectangular steel bars, Catawissa Unions are free from sand and blow holes. They will expand and contract with the pipe, assuring tight joints.

THREADS . . . Catawissa Unions and Valves are supplied with either FULL ACME Threads or U. S. Standard V-Threads in the union nuts and on the female end.

SEATS . . . in all Catawissa Unions are a 55° angle on the female end to a Ball on the male end, assuring a perfect seal even when the pipe is not perfectly aligned. Carefully hand-ground seats which require no packing are inspected and tested under water to assure holding qualities.

Contact your nearest "Oilwell" representative to assist you with all your oil-field problems

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UNITED STATES STEEL

ing Britain because of the Idemitsu company's import of Iranian oil.

The Russians have made offers to trade oil under barter proposals to several other western countries. Discussions have been under way with Sweden, and minor amounts of both crude and products have been shipped for some time from Russian-controlled areas into northern Italy. These commercial deals and approaches involving Russian oil and other goods such as timber, coal, and minerals are a part of a so-called Russian trade offensive that has developed concurrently with the new Russian peace campaign since Stalin's death.

Competition is question . . . Responsible oil company officials are reluctant to place any interpretation on the recent Russian oil offers. The quantities involved are relatively small in all cases, and according to one official, the quality of Russian oil products is poor. If the various trade deals materialize, some of the oil would probably be products from rehabilitated refineries in Romania, where the industry is controlled by a joint Soviet-Romanian company.

Since the late 1930's, virtually all Communist oil production has been used internally with no effect on international petroleum markets. The question now is whether the international companies are facing a new era of competition from Russian oil in their markets abroad.

In the 1920's, Russia was a prominent oil exporter. During this period the Russians had no hesitation about underselling the market when it was to their advantage. By the latter part of the prewar period, however, Russian exports had dwindled until they were an insignificant factor in the world oil trade.

Shell Adding Units

Group's current construction program abroad designed to expand crude-oil capacity and special process facilities

THREE projects which will add 130,700 bbl. daily in crude-distillation capacity to Shell Group refineries outside the United States are included in a construction program now under way.

A fourth has already been completed, and the program calls for five more projects to provide specialized process facilities for other group companies.

One of the largest projects in the group's program was completed recently when the third distillation unit at Cardon refinery in Venezuela went on stream. The refinery now has a capacity of 170,000 bbl. daily, including heavy crude intake to the cracking plants.

Cardon's present facilities consist of three crude units, two thermal cracking units, a complete lubricating-oil plant, high-vacuum distillation unit, thermal reformer, polymerization unit, and gasoline treating plants. The third distillation unit, originally a redistillation unit, was built at the same time as the first in 1949. Conversion work, carried out by the Lummus Co., cost the equivalent of approximately $1,700,000, with another $850,000 for additional tanks and pipe lines.

Projects of group companies which are still under construction are:

. . . Shell Refining (Australia) Proprietaries, Ltd., Geelong, Australia, 25,000-bbl. daily crude distillation unit under construction, probable completion date, mid-1954.

. . . Burmah-Shell Refineries, Ltd., Bombay, India, comprehensive 40,000-bbl. daily refinery projected, probable date of completion of distillation units, early 1955, probable total completion, mid-1955.

. . . N.V. de Bataafsche Petroleum Mij., Pernis, Netherlands, expansion from 100,000 to 165,700 bbl. daily under construction, probable completion date of distillation units, fourth quarter 1953.

In addition to these three projects and the Cardon expansion, another group company, Cie de Raffinage Shell-Berre, early this year completed expansion of the Pauillac refinery at Pauillac in France from 6,300 to 12,000 bbl. daily.

Projects providing specialized process facilities at refineries of the Shell group are:

. . . Diadema Argentina S.A. de Petroleo, Buenos Aires, lube-oil refinery, 600-bbl. daily output capacity, under construction, probable completion date, 1954.

. . . Cie. de Raffinage Shell-Berre, Berre France, 8,000-bbl. daily catalytic cracking unit, scheduled to have been completed mid-1953.

. . . N.V. de Bataafsche Petroleum Mij., Pernis Netherlands, extension lube-oil refinery, 1,750-bbl. daily output capacity, under construction, probable completion date, early 1955.

. . . N.V. de Bataafsche Petroleum Mij., at Pernis, solvents plant, 16,000 tons per year capacity, under construction, probable completion date, May 1954.

. . . N.V. Curacaosche Petroleum Industrie Mij., Curacao, N.A., extension lube-oil refinery, 2,100-bbl. daily output capacity, under construction, probable completion date, early 1954.

In addition to these projects providing specialized equipment, several others have been completed over the last year and the facilities are in operation. Shell Co. of Australia, Ltd., at Clyde, Australia, placed in operation a 250-bbl. daily output capacity lube-oil refinery. Soc. des Produits Chimiques Shell-St. Gobain finished a 7,500-ton per year solvents plant at Berre, France. In Italy, Soc. per l'Industria Italiana del Petrolio early this year was scheduled to have finished construction of a 1,600-bbl. daily thermal reformer.

MIDDLE EAST

Crude Price Uniform

Gulf, Shell reduce price 3 cents to meet competitors

PERSIAN Gulf crude-oil prices have settled down to a uniform basis as a result of adjustments by two remaining holdout companies.

Gulf Oil Corp. reduced its selling price for 31°-gravity Kuwait crude by 3 cents to $1.72 to meet the lower price of the other Kuwait partner, Anglo-Iranian Oil Co., Ltd., for this same crude *(The Oil and Gas Journal, August 3, page 46)*.

Anglo-Iranian's earlier 3-cent cut in the Kuwait price preserved the 15-cent differential which exists between this crude and Saudi Arabian oil, f.o.b. the Persian Gulf. Saudi Arabian crude of 36° gravity at Ras Tanura carries a $1.97 price.

The Shell organization, which buys a substantial part of the Gulf production in Kuwait and also holds an interest in Iraq Petroleum Co., Ltd., reduced its eastern Mediterranean price for 36°-gravity crude to $2.39 to conform to lower prices of other companies. Shell met the new $1.72 price for Kuwait crude and, following the other I.P.C. partners, reduced the price for Zubair crude at Fao to $1.92. Shell also came down to $2.11 for 39°-gravity Qatar crude, the same price announced by other companies.

These actions rounded out the price changes in the Middle East. Crude of 36° gravity in the Persian Gulf is now $1.97, up 22 cents, with a 5 cents lower differential for Zubair and a 5-cent higher differential for Qatar.

The eastern Mediterranean price is $2.39, up 10 cents.

Meanwhile, distillate-range products were reduced in price at Aruba in a move expected to affect world markets. Esso Export Corp. cut its posted cargo price, effective July 30, for kerosine by 0.5 cent to 9.0 cents; No. 2 by 0.25 cent to 8.25 cents; 43-47 diesel-index oil, to 8.375 cents from 8.75 cents; 48-52 diesel-index to 8.5 cents from 8.875 cents; and 53-57 diesel-index, to 8.625 cents from 9 cents. No changes were made in gasoline or heavy fuel oil.

FAR EAST

Japan Sells Naval Refinery

The Japanese Government is selling the former Japanese Navy No. 3 fuel-oil depot and refinery at Tokuyama, Yamaguchi Prefecture, to the Showa Oil Co.

Applications to buy the facilities had been made by Showa and the Idemitsu company. The Ministry of International Trade and Industry decided on Showa because of its refining experience. Showa is expected to invest a billion yen, or about $2,800,000, to provide facilities which will produce 6,000 bbl. of gasoline daily.

Another former Japanese Navy depot-refinery is at Yokkaichi in central Japan. The plant was at one time marked for reparations but the government has been considering the matter of its disposal with some sentiment favoring government operation. The minister of international trade and industry recently told a parliamentary committee that the government had decided in favor of a lease to a qualified oil company and that once leased, the government would not interfere in its management.

Indian Exploration Talked

Three foreign oil companies—Standard-Vacuum Oil Co., Burmah Oil Co., Ltd., and American Overseas Exploration, Ltd. (Caltex)—may participate in exploratory work in the Bengal basin of India.

Dr. S. S. Bhatnagar, secretary to the Indian Ministry of Scientific Research and Natural Resources, said in Bombay that he had had discussions with the three companies during a recent trip abroad.

Standard-Vacuum a year and a half ago carried out an aerial survey of the Bengal Basin and has been negotiating with the Indian and Pakistan governments on continuing this program. Burmah Oil now has the only production in India, about 6,000 bbl. daily, through its subsidiary, Assam Oil Co., Ltd., which operates Digboi field. Dr. Bhatnagar, in his comments on the Indian oil situation, said the Assam company was now making special efforts to develop and extend this field.

Line Contract Let

The Bombay Port Trust has let contract to Merritt-Chapman & Scott Corp. for construction of about 50 miles of pipe lines to link two oil refineries now under construction at Bombay, India, with an offshore marine terminal.

The $4,000,000 project includes the laying of seven lines ranging from 8 to 24 in. in diameter to pump crude oil from tanker to refinery, products from refinery to tanker, and to supply the tankers with water.

The lines will connect the two refineries on the outskirts of Bombay, being built by Standard-Vacuum Oil Co. and Burmah-Shell, with a terminal off Butchers Island, about 2½ miles from shore.

Construction will be handled by Merritt-Chapman & Scott Corp. of India in association with Hindustan Construction Co., Ltd., of Bombay.

About a third of the total 262,000 ft. of lines will be laid under water.

LATIN AMERICA

Evaluation Well Drilling

A second well is now being drilled and others are planned later to evaluate the area in the State of Barinas in Western Venezuela where Venezuelan Petroleum Co. (Sinclair) made a discovery in its Sinco 1 wildcat several months ago.

E. L. Steiniger, Venezuelan Petroleum president, said that while the well appears to be a good one, further drilling is necessary to evaluate the immediate block of concessions, comprising 11,608 acres, on which the discovery was made.

Sinco 1, Steiniger said, tested three sands at 9,140 ft., 8,986 ft., and 8,560 ft., which flowed at a rate of approximately 312, 600, and 400 bbl. daily, respectively. Gravities ranged from 25.1° to 27.9°. The area is approximately 240 miles from the coast, he added, and actual productive capacity of the well cannot now be determined since there is no outlet.

Venezuelan Petroleum's Sinco discovery is in the same general area of this remote part of Venezuela where Socony-Vacuum completed several productive wells about 4 years ago. Socony-Vacuum shut in the wells and suspended operations, reportedly because it needed more acreage for development to justify possible construction of the long pipe line to the Caribbean Coast.

In his summary of company operations for the first 6 months of 1953, Steiniger reported that the Sinco well was the only producer of four wildcats drilled during the period.

AFRICA

Egypt to Release Refinery

The Egyptian Government is planning to turn over control of its refinery at Suez to a new nongovernment body in a move to eliminate red tape and improve efficiency.

A law to this effect is being drafted by the Ministry of Commerce and Industry and will be placed before the cabinet for approval. The new group controlling the plant would consist of Egyptian business men and possibly representatives of leading oil companies.

Capacity of the refinery is now being expanded and is scheduled to be raised to about 26,000 bbl. daily. The government hopes that the refinery will eventually be able to handle 30,000 bbl. daily.

The minister of commerce and industry also said recently in Cairo that the proposed Suez-Cairo pipe line would be started as soon as the commission composed of representatives of the ministry and the National Production Council had finished studying a report on the project by a group of technical experts.

International Briefs

Discovery of a new pay zone in the producing properties of Lobitos Oilfields, Ltd., in Peru was disclosed July 28 at the company's annual meeting in London. Well 596 was completed for 400 bbl. daily, flowing, in the basal Salinas sand. The formation is found at the La Brea-Parinas Estate but is a new discovery in Lobitos.

The Ebro Valley wildcat which was drilled in northern Spain by a group of United States independents is reported to have been abandoned at a total depth of about 11,400 ft. Whether other tests will be undertaken elsewhere in Spain by the group is not known. The Spanish Government was participating financially in the operation through the National Institute of Industry.

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Veteran Geologist

Moody begins 34th year with California Standard

GEORGE B. MOODY "attached" himself to Standard Oil Company of California in 1920 and as Moody expresses it today, the company hasn't "shaken me loose since."

If Standard of California has entertained any ideas about "shaking" the veteran field geologist loose, the firm has exhibited them in a peculiar way. He is presently chief reserves engineer on the executive staff and serves as consultant to engineers of wholly owned subsidiaries on methods of estimating and reporting reserves of crude and natural gas. A practicing petroleum geologist since his college days, Moody completed his thirty-third year with Standard of California in July.

Born in Denver in 1889, Moody was graduated from the University of California in 1912 with a degree in chemistry and "emphasis on paleontology and geology." His Phi Beta Kappa membership and honors from other scholastic societies failed to jibe very well with his own statement that he "suffered the customary schooling" during those years and "finally captured a B.S."

He is "particularly proud of a K.O. degree in boxing acquired at Yale university in extra curricular activities."

After a year of graduate studies, Moody spent the next several years as a high school physical-education instructor in Berkeley and Hollywood keeping up his interest in geology with summer field jobs.

When he was rejected for military service in 1917 because of an ear ailment, Moody joined Southern Pacific Co. as resident geologist in Kerto, Calif. The following year he moved to California Petroleum Corp. and 2 years later joined Standard of California.

Since that time, Moody has served in field assignments over a large part of southwestern United States, Mexico, and the Philippines. In 1931 he joined the Los Angeles office of the company to do work in connection with reserves, evaluations, earthquake hazards, and related research projects. Four years later he took over similar duties in the San Francisco office. He was named senior reserves engineer in 1944 and chief reserves engineer in September 1951.

Active in professional circles of the industry, Moody is affiliated with the American Association of Petroleum Geologists, American Petroleum Institute, Seismological Society of America, Petroleum Production Pioneers and Petroleum Club of Los Angeles.

He is chairman of the Pacific Coast subcommittee on crude-oil reserves and a member of the A.P.I. national committee and is a member of the California subcommittee of the American Gas Association committee on gas reserves.

Curtis Morris has resigned as vice president of Transcontinental Gas Pipe Line Corp., Houston, to join the executive staff of the American Gas Association October 1. Initially he will study the A.G.A.'s facilities and services devoted to natural-gas production and transmission. He joined Transcontinental in 1949 and has handled legislative, tax, and public-relations matters for the company.

Robert J. Moffatt has resigned as division production geologist for Carter Oil Co. in Shreveport to become a consulting petroleum geologist there. He is a 1941 graduate of the University of Texas and joined a group of independent operators in Fort Worth following his graduation. He has been with Carter since 1947.

Ray E. Carter has resigned as chairman of the board of Unit Rig & Equipment Co. to become head of Triangle Oil Co., a new oil and gas producing firm. Carter had been with Unit Rig more than 16 years. **E. A. Smith,** president of Service Drilling Co., Tulsa, and **William Guier,** Tulsa, one of the founders of Unit Rig, will be associated with Carter.

Lloyd D. Somers, formerly a field foreman for The Texas Co. in Seminole, Okla., has been named superintendent of drilling and production for O. F. Warren, independent, in Tulsa.

W. B. BERWALD

W. B. Berwald, assistant Shreveport division manager for Ohio Oil Co., has been named to succeed **J. J. Frommer** as division manager. Frommer retired August 1 after 34 years with the company. **Glen B. Gariepy,** Los Angeles division geologist, will become assistant Shreveport division manager on September 1. **R. G. Kurtz,** senior geologist in San Antonio, Tex., has been named to succeed Gariepy at that time.

G. B. GARIEPY

R. G. KURTZ

J. A. Boege has been appointed manager of the Vernon, Calif., refinery of General Petroleum Corp., Los Angeles. **R. A. Baker** has been named to succeed Boege as manager of laboratories.

H. A. Eklund has resigned as vice president and manager of California operations for British American Oil Producing Co. to open offices in Los Angeles as an independent operator. He has been with British American 15 years.

Dr. Ir H. ter Meulen, who for the last 3 years has been head of the oil refineries department of the Royal Dutch-Shell organization at The Hague, has been appointed managing director of the two Royal Dutch-Shell subsidiaries in the Netherlands Antilles, N. V. Curacaosche Petroleum Industrie Mij. and N. V. Curacaosche Schoopvaart Mij. Ter Meulen joined the group in

1928 as a chemical engineer in the Amsterdam laboratory and subsequently served in various capacities in Romania, Austria, the United States, Curacao, and Borneo. As managing director of the Curacao companies, he succeeds **H. van Drimmelen** who will later take up a new position in Europe.

Dale Nix, vice president in charge of technical and supply services for Arabian American Oil Co., recently was awarded the Distinguished Achievement Medal, the equivalent of an honorary degree, by Colorado School of Mines. He was graduated from the school 27 years ago as a petroleum engineer.

W. B. Logan and **F. H. Holmes** have been promoted to assistant general managers of the refining department

W. B. LOGAN

F. H. HOLMES

of The Texas Co. Logan, who has been with Texaco since 1922, has been manager of operations of the refining department since 1950. Holmes, formerly assistant manager of operations, has been with the firm since 1927. **L. C. Kemp, Jr.,** director of research, has been appointed assistant to the vice president. Kemp has been succeeded as director of research by **Dr. W. J. Coppoc,** formerly associate director of research, and **Dr. C. E. Moser** has been named associate director of research. **Dr. R. L. Sawyer** has been promoted from supervisor of the fuels development research department to assistant director of research at Texaco's Beacon, N. Y., laboratories, succeeding Dr. Moser.

D. Brittain Briggs, formerly a process engineer for Carthage Hydrocol, Inc., has joined Grace Chemical Co. as a technical assistant in the new nitrogen plant now under construction near Memphis.

William R. Gignilliat has resigned as land department manager of Transcontinental Gas Pipe Line Corp., Houston, to become vice president of South Atlantic Gas Co. in Savannah, Ga.

Creole Holds Coordination Conference

About 50 executives of Creole Petroleum Corp.'s producing, refining, and marine divisions participated recently in a 3-day coordination conference at the newly opened Hotel del Lago in Maracaibo, Venezuela. Shown at the registration booth (left to right) are: W. W. Damm, engineering section, Standard Oil Co. (N. J.); J. W. Matthews, refinery engineer, Creole; J. D. Long, Short Hills, N. J., who presented a paper on "Recent Developments in Fuel Reduction Studies"; H. A. Jarvis, Western Division manager and member of the board of directors of Creole; and A. W. Schramm, Refining Coordination Division, Jersey Standard.

Harvey L. Garland, engineer for Seaboard Oil Co. of Delaware, has been transferred from Powell to Casper, Wyo.

Fred Johnson, production foreman for Gulf Refining Co.'s eastern production division, has been transferred from Henderson, Ky., to Centralia, Ill.

G. W. Martin, tool pusher for Zephyr Drilling Corp., has been transferred from Tatum to Hobbs, N. M.

B. P. Eastin, division manager for Shell Oil Co. at Ventura, Calif., will begin a 6-month assignment in the main offices at New York, September 1. During his absence **W. F. Bates,** general drilling superintendent in the Los Angeles area offices, will be stationed in Ventura as acting division manager. Recent promotions and changes in the area offices include: **J. E. Welsh,** geologist, moved from Los Angeles to Ventura; **C. V. Booth,** geologist, from Long Beach to Ventura; **R. A. Hoffman,** geologist, from Bakersfield to Sacramento; and **H. T. Herlyn,** now associated with exploration in Alaska, promoted from junior geologist to geologist.

Virgil B. Harris has been elected a director and vice president in charge of operations and **Mac D. Oliver** has been elected a director and vice president in charge of engineering for San Juan Oil Co. of Dallas. Harris, who has been with the company 2 years, formerly was associated with Core Laboratories, Inc., and was a district superintendent for the old Barnsdall Oil Co. He also has been named a petroleum engineer and geologist for Texas Consolidated Oils, operated by San Juan. He is vice president of Mazda Oil Corp., which also is managed by San Juan. Oliver has been with San Juan 2½ years and formerly was with Cable & Stine in Wichita Falls, Tex. Oliver also is managing partner for Bradley, Oliver & Associates, petroleum consulting firm operated in connection with San Juan.

Frank A. Boyd has been appointed petroleum engineer in charge of the Pittsburgh office of Texas Eastern Transmission Corp. He previously was a consulting geologist and engineer in Pittsburgh and prior to that was chief geologist for Manufacturers Light & Heat Co. He is a graduate of Pennsylvania State College and did graduate work in geology at Carnegie Institute of Technology.

J. W. Bawcom, drilling engineer for Kerr-McGee Oil Industries, Inc., has been transferred from Midland, Tex., to Oklahoma City.

J. L. (Lee) Popham, Houston petroleum engineer, has joined Continental Oil Co. as senior research engineer in the development and research department in Ponca City, Okla. For the past 3 years he has been a special service engineer for Magnet Cove Barium Corp., Houston.

PERSONALS

Lou Sylvestre, scout for British American Oil Co., Ltd., in Regina, Sask., has been elected secretary of the Central Canada Oil Scouts Association. He succeeds **Jimer Cameron,** Union Oil Co. of California, who has been transferred to his company's Calgary, Alta., office.

Jack A. Crichton has been appointed president of Oil & Gas Property Management, Inc., and vice president of Empire Trust Co. in Dallas. He is a past vice president and director of DeGolyer & MacNaughton, Dallas, and a past vice president and director of San Juan Oil Co., Dallas.

Lawrence C. Stratton has been appointed division superintendent of production for Sinclair Oil & Gas Co. in the northeast Texas division, which

L. C. STRATTON

K. E. THORNTON

comprises North and East Texas, Louisiana, Arkansas, and Mississippi. His headquarters will be in Fort Worth. Stratton has been assistant division superintendent of production at Fort Worth since 1949. **Kenneth E. Thornton** has been named division superintendent of production in the Wyoming-Montana division in Casper, Wyo. He has been assistant division superintendent there since October 1952. The Wyoming-Montana division includes Wyoming, Montana, Colorado, Nebraska, North Dakota, and Alberta, Canada.

Harold M. Balch, assistant to the president and manager of industrial relations for Sinclair Oil & Gas Co., Tulsa, has been elected a member of the board of directors. He was appointed assistant to the vice president in 1935.

W. F. Allmon, Jr., mechanical engineer for Shell Oil Co., has been transferred from the Midland, Tex., area to Tulsa. Other company changes include: **F. T. Connolly,** transferred from the Colorado division to Tulsa as a geologist; **E. B. Maki, Jr.,** exploitation engineer, transferred from the technical services division in Houston to Tulsa; **R. M. Reed,** mechanical engineer, transferred from Colorado to the Oklahoma division; **R. A. Shapiro, Jr.,** mechanical engineer, transferred from Tulsa to the Houston area; and **D. D. Stokes,** transferred from the technical services division in Houston to Tulsa and promoted to junior exploitation engineer.

Fred W. Meyer, for the past 5 years chief engineer of the refinery division of Bechtel Corp., has been elected a vice president. **A. J. Orselli,** until recently manager of construction of the eastern division, has been transferred to the power division as vice president and assistant to **J. P. Yates,** senior vice president. **Myles C. McGough** has been elected vice president and eastern division manager.

Richard C. Bannister has resigned as district geologist for Standard Oil Co. of Texas in San Angelo, Tex., to join the geological staff of Hancock Oil Co. in Midland, Tex.

Herman J. Brunt has been named superintendent of production for the Midland, Tex., district of Ohio Oil Co. He formerly was district superintendent in Sidney, Neb. In his new post Brunt succeeds **J. A. Grimes, Jr.,** who has been promoted to division production superintendent in Houston.

DEATHS

D. L. (Roy) Hoober, 79, an early day director and officer of Sinclair Oil Corp., died August 4 in Kansas City. Before his retirement more than 15 years ago he was advertising manager for Sinclair Refining Co. in New York. In 1919 he was one of 25 leading oil firm officials who attended a dinner in New York in honor of the National War Services Committee, out of which the American Petroleum Institute was formulated. He was one of the original members of the Oil Men's Club of Kansas City.

L. E. Delcuze, 68, who had served as assistant to the vice president of Gulf Oil Corp. and assistant secretary of Gulf Refining Co., died in Houston July 31. He retired in 1950.

Winfield Scott Biggs, 73, Tulsa, independent oil operator, died August 3 in a Tulsa hospital. He came to Tulsa in 1921 from Muskogee, Okla., and entered the real estate business before becoming an independent operator a short time later. He left Tulsa in 1928 and engaged in the oil business in Tecumseh, Okla., Houston, and in Illinois and Mississippi before returning in 1946.

Ira A. Smith, 71, manager and local representative for the Tulsa offices of Standard Oil Co. (Ind.) from 1922 to 1939, died August 1 in a Tulsa hospital. From 1939 until his retirement in 1946 he was representative of Standard of Indiana in Council Bluffs, Iowa.

Harrison Teter, driller, died July 28 in Long Beach.

Charles R. Gilmore, Tulsa, about 65, prominent lease broker, died August 5 in a Lafayette, La., hospital. He came to Tulsa in 1912 and joined the land department of Oklahoma Natural Gas Co. He later worked for Sinclair Oil & Gas Co. and the old Gypsy Oil Co.

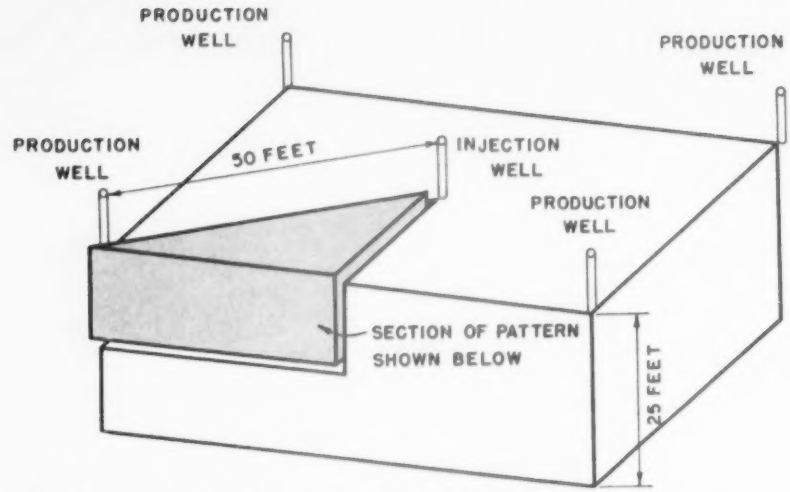
G. W. Baldridge, 54, veteran foreman for Oklahoma Natural Gas Co., died July 31 as the result of burns suffered in a gas-line explosion July 8. Three other Oklahoma Natural men lost their lives in the explosion. Baldridge had been with Oklahoma Natural since 1927.

Sam E. Monroe, 83, retired division manager for The Texas Co., Houston, died July 28 in Houston. A native of Thomasville, Ga., Monroe formerly was associated with Waters-Pierce Oil Co. He joined Texaco as a salesman and later was named division manager, a post he held for 15 years before retirement in 1936.

William Edward Windover, 69, prominent Canadian driller who brought in the famous Sanson gusher in Petrolia field in 1900, died in Sarnia, Ont., recently.

Edgar Ralph (Andy) Kilpatrick, 47, Arcola, Tex., foreman for Gray & Wolf Drilling Co., died in Houston July 28.

George W. Smith, foreman at Pan American Refining Co.'s plant at Texas City, Tex., died in Galveston, Tex., July 28. He formerly was with the old Standard Oil Co. and had been with Pan-Am since 1933.



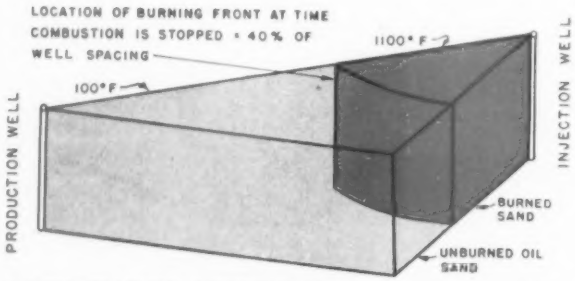
Above is schematic representation of five-spot field test of in-situ combustion method. Pie-shaped slice shown above is enlarged in three diagrams at right which trace temperature patterns during tests.

A much higher percentage of low-gravity crude can be recovered from oil-bearing formations if reservoir temperature is raised, thus reducing oil viscosity. Magnolia's Dallas research laboratory and southern Oklahoma field tests prove that the reservoir oil can be ignited and will continue to burn in the form of a slowly advancing high-temperature front, as long as the necessary air flux is maintained to support combustion. This, briefly, describes

Temperature Distribution

for in-situ combustion method whereby combustion is stopped at the 40 per cent front location (thermal diffusivity of sand and overburden assumed as 0.023 sq. ft. per hour).

IN considering various methods of applying the in-situ combustion process to actual oil fields, one scheme of operation which appears to have merit involves intentional interruption of the advance of the combustion front at a prescribed distance



1 TEMPERATURE DISTRIBUTION in test area at time combustion is stopped. Colored portion of diagram shows burned sand.

IN-SITU COMBUSTION . . .

Newest method of increasing oil recovery

by C. S. Kuhn and R. L. Koch

THE recovery of a higher percentage of the oil remaining in oil-bearing formations after depletion of initial reservoir energy has constituted a major challenge to the petroleum industry for a number of years. Although conventional secondary-recovery methods involving gas injection and water flooding usually effect higher recoveries where the crude oil is of high gravity, such methods are not always effective in increasing the ultimate recoveries of low-gravity and viscous crude oils. Inasmuch as the quantity of these so-called "unrecoverable heavy oils" in the United States alone is probably in excess of 4 billion barrels, in comparison with a 1953 estimate of total domestic oil reserves of 33 billion barrels,[10] the development of suitable methods for recovery of such oils obviously poses a problem of considerable importance.

Of the various methods which have been proposed for increasing the recovery of low-gravity viscous oils, those involving application of heat to the reservoir to increase oil mobility by decreasing oil viscosity probably have received most attention.[1,2,3,4,5,6,7,8,9,11,12] However, only a few of these methods had been tested satisfactorily some six years ago when work on thermal recovery methods by Magnolia Petroleum Co.'s field research laboratories was first started, and little or no information was available which would permit appraising such processes from a technical or an economic standpoint. Consequently, studies were first undertaken to provide information for this purpose. Initial results, although of a strictly relative character, indicated a number of possible advantages of an in-situ combustion operation over the more widely studied heat-injection techniques, and thereby served to guide the work in the former direction.

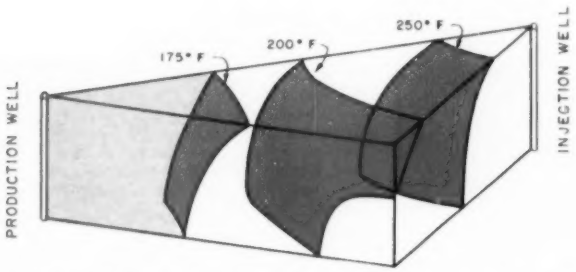
Subsequent experimentation with an in-situ combustion process for oil recovery has been highly encouraging, and has recently culminated in plans to expand the experimental work being carried out in the field to a five-spot

from the air injection wells and thereafter allowing radial transfer of heat stored in the burned sand sections in the direction of the producing wells. This would ultimately permit raising the average reservoir temperature to a point where improved oil recovery would result from a lowering of the oil viscosity.

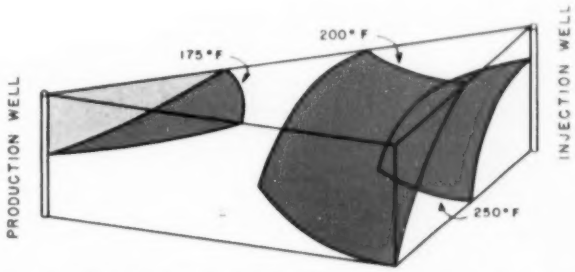
The temperature distributions have been calculated for such a situation assuming that transfer of heat after cessation of combustion is by conduction only. Presented in the accompanying oil-field models are temperature distributions after periods of elapsed time of 1 and 2 years for a developed five-spot well pattern having a spacing between the injection and production wells of 50 ft. and a sand thickness of 25 ft.

On the assumption that burning proceeds at 1,100° F., to a front location of 40 per cent in a reservoir having a temperature of 100° F., a temperature increase of 75° F. at the production wells should be attained within about 2 years. For most low-gravity crude oils a 75° F. temperature rise will reduce their viscosities very considerably; for example, by increasing the temperature of a typical 14° A.P.I. crude oil from 100° to 175° F. its viscosity will drop from about 630 to 67 centipoises.

This ninefold viscosity change coupled with some type of active gas drive would undoubtedly increase ultimate oil recovery very substantially, and the efficiency of utilization of the thermal energy produced would be exceedingly high.



2 **TEMPERATURE DISTRIBUTION** in test area 1 year after combustion is stopped. Colored areas show temperature isotherms.



3 **TEMPERATURE DISTRIBUTION** in area 2 years after combustion is stopped. Note continued progression of high-temperature isotherms.

well pattern in order to derive further information regarding the engineering factors influencing full-scale application of the process. The results of previous work on the process carried out both in the laboratory and in the field are summarized briefly herein.

Laboratory Work

First experiments on the in-situ combustion process were carried out with oil-water-sand packs in small tubes, and were of a highly exploratory nature. Nevertheless, even under the rather unfavorable high-heat-loss conditions prevailing in these early experiments, it was demonstrated conclusively that crude oil could be ignited in the presence of sand and water and, moreover, that it would continue to burn in the form of a slowly advancing high-temperature front of finite thickness as long as the necessary air flux was maintained to support combustion.

Furthermore, it was learned that somewhat less than 15 per cent by weight of the oil in place (after initial air drive and before combustion) was consumed as fuel, and that substantial increases in recovery of the oil over that which could be obtained by hot-air drive alone were effected by the in-situ combustion method. These findings served as the real stimulus to continue further work on the problem, and led to a considerably expanded development program.

In succeeding years, over 100 experiments were carried out in sand-packed tubes of the type shown in Fig. 1, with the object of defining the effect of the major variables (air rate or flux, pressure, oil properties, oil-sand properties, etc.) on the combustion and on the liquid displacement processes. Such tubes ranged from 4 to 16 in. in diameter and from 2 to 35 ft. in length. They were operated in both horizontal and vertical positions, and were equipped with facilities for controlled entry of air and for electrical ignition of the oil sand at one end, and for discharge and measurement of gases and liquids at the other end.

Provision was made for following the progress of the combustion front by means of a series of thermocouples located along the central axis of the tube. Changes in pressure drop along the tube were followed by means of a differential manometer.

Preparatory to conducting a combustion experiment in one of these flow tubes, the appropriate quantities of oil, water, and sand were packed into the tube and the system driven with air (room temperature) under a fixed injection pressure until production of liquids essentially ceased. Ignition of the partially desaturated "oil sand" was then accomplished by means of an electrical heater mounted within 2 to 3 in. of the air influx end of the oil sand, while flowing air at a rate necessary to support combustion. After it was apparent that combustion had been initiated, as evidenced by the uniform movement of the high-temperature front down the tube, the electrical heater was turned off and the reaction continued by controlling mass air rate and absolute pressure.

"Oil recoveries of over 60 per cent, and frequently as high as 90 per cent, of original oil in place prior to combustion, were obtained in these laboratory experiments."

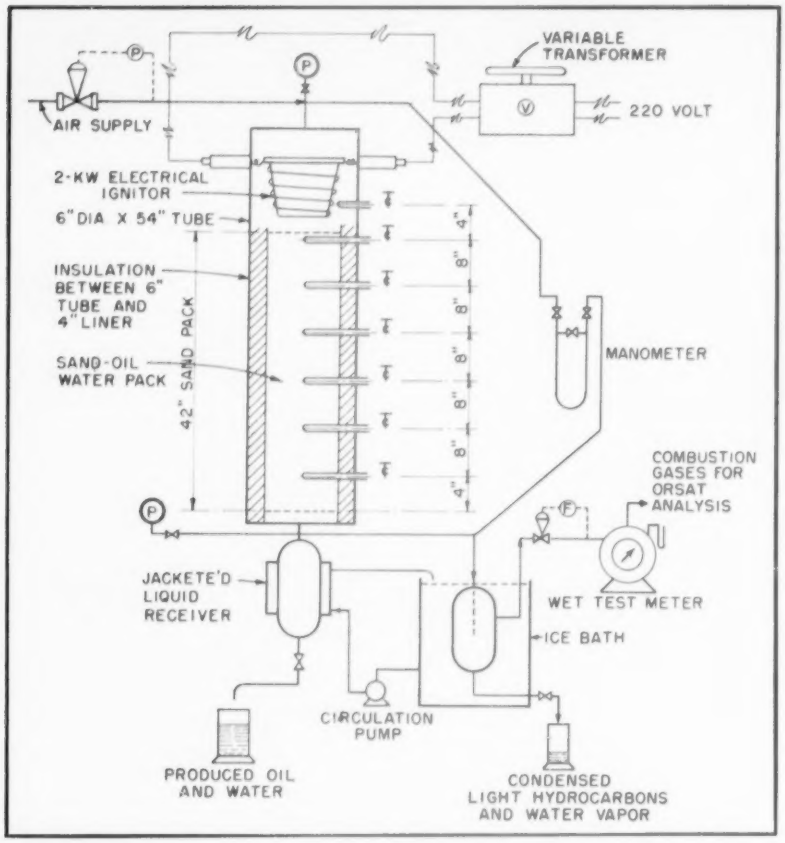


Fig. 1—Experimental equipment arrangement for combustion studies.

A continuous time-temperature record normally was made at a series of thermocouple stations along the central axis of the tube. Fig. 2 shows a typical set of such data converted, for convenience in representation, to a plot of temperature versus distance along the sand pack at three selected times during a given experiment. The continuous uniform advance of the combustion front (corresponding to a peak temperature of about 1,600° F.) is immediately apparent. Completely liquid-desaturated clean sand was usually left behind the combustion front (to the left of the maximum temperature).

In fact, direct observation of the oil sand packs during various stages of combustion has confirmed qualitatively the existence of at least four coexistent but distinct transient regions located along the tube in the following order: (1) clean burned sand, (2) the combustion zone itself, (3) coked sand, and (4) partially liquid-desaturated oil sand. The existence of a coked sand region

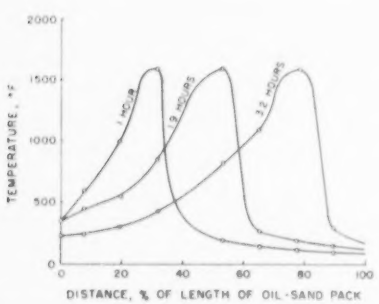


Fig. 2—Temperature distribution along an oil-sand pack during combustion. Conditions: Oil gravity, 9.6° A.P.I. at 60° F.; injection pressure, 87 psig.; air rate, 324 s.c.f.h. per sq. ft.; pack length, 41.5 in. Results: Average CO_2 content, 11.1 per cent; rate of front advance, 27 ft. per day.

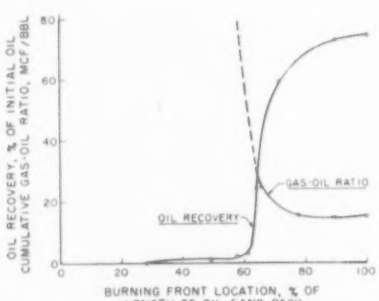


Fig. 3—Oil recovery and gas-oil ratio during combustion of an oil-sand pack. Conditions: Oil gravity, 9.6° A.P.I. at 60° F.; injection pressure, 87 psig.; air rate, 324 s.c.f.h. per sq. ft.; pack length, 41.5 in.

THE AUTHORS

Magnolia Petroleum Co.'s Field Research Laboratory Scientists Carl S. Kuhn, left, and Robert L. Koch examine two core samples cut during experimental work that led to the development of a new process of heavy crude oil recovery called "In-situ Combustion." Effect of the recovery method can be seen by comparing the light core sample, which has had its heavy oil removed, and the dark core, which still holds its crude. Kuhn and Koch led the research work on in-situ combustion, a joint development of the "Flying Red Horse" companies, Socony-Vacuum Oil Co., Inc., Magnolia, and General Petroleum Corp.

(3) just ahead of the combustion front is interpreted as indicating that some cracking, visbreaking, and distillation of the crude oil occurs in this region and that the resulting coke represents the bulk of the actual fuel subsequently consumed in the process.

Downstream from the combustion front, considerable quantities of heat are conveyed to the oil sand by transfer between flowing fluids and by condensing vapors. The carbon dioxide and water vapor in the combustion gases are particularly effective heat-transfer agents because of their high molal heat capacities; in fact, on occasions they have been purposely injected along with the air to further enhance

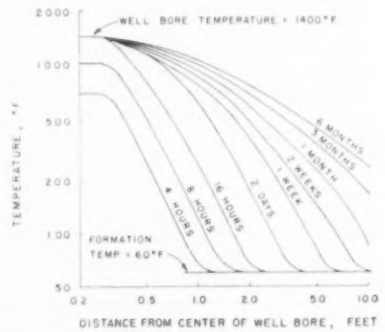


Fig. 4—Temperature distribution in vicinity of injection well prior to ignition. Conditions: Thermal diffusivity, 0.023 sq. ft. per hour well radius; 0.276 ft. (6⅝-in. casing), constant power release of 1.5 kw. per foot until 1,400° F. is reached.

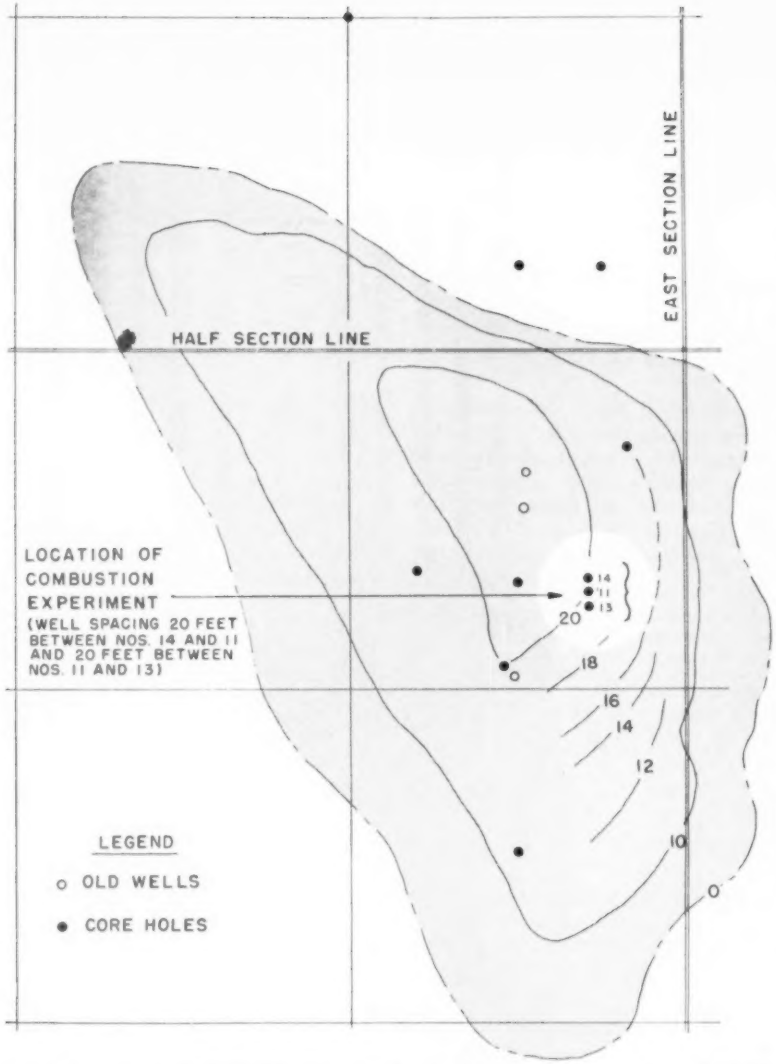


Fig. 5—Isopachous map of sand lens in southern Oklahoma showing location of combustion experiment. Scale 1 in. = 350 ft.

the downstream transfer of heat contained in the burned sand region. Definite steam plateaus are frequently observed on the temperature records and are attributed primarily to the vaporization and subsequent condensation of the interstitial water contained in the oil sand.

Although the fluid-flow and heat-transfer mechanisms involved in this in-situ combustion recovery process are highly complex, they nevertheless are combined in a rather fortuitous way to insure very effective displacement of liquids from an oil sand. Oil recoveries* of over 60 per cent, and frequently as high as 90 per cent, of original oil in place prior to combustion (after air driving at room temperature), were obtained in these laboratory experiments. Fig. 3 shows a plot of cumulative oil recovery and cumulative air-oil ratio versus combustion front location; these data correspond to information on temperature distribution given in Fig. 2 for the same experiment.

* Recovered oil used in computing per cent oil recoveries does not include light hydrocarbons and other gaseous or readily vaporizable products, nor does it include oil burned during the experiment.

"The amount of crude oil burned as fuel in the process was seldom greater than 15 per cent and on occasions it was as low as 2 per cent of oil in place prior to combustion."

The oil-recovery curve is representative of the oil-displacement histories observed in all linear-flow combustion experiments, in that similar curves were usually obtained for packs of different length where oil saturations with a given oil were of the same order of magnitude. At higher and lower oil saturations, the oil-recovery curve was displaced to the left and to the right, respectively, but in all cases the majority of the oil was produced during the latter half of the experiment.

The amount of crude oil burned as fuel in the process was seldom greater than 15 per cent and on occasions it was as low as 2 per cent of oil in place prior to combustion; this corresponds to about 2 and 0.8 lb. of fuel per cubic foot of oil sand, respectively. Generally speaking, fuel consumption is higher for the low-A.P.I.-gravity oils, and is an important factor in the control of the rate of advance of the combustion front.

It was determined experimentally, and by computations made on the basis of heat-transfer considerations, that there is a minimum rate of advance of the combustion front which must be maintained in order to prevent extinguishing the burning. This minimum rate is governed by the rate of heat loss from the burning zone to the surroundings which in turn depends upon such factors as sand thickness, formation heat conductivity, and combustion temperature.

Theoretical Studies

In addition to the experimental work already described, certain theoretical and computational studies also played an important role in the development of the process, particularly from the standpoint of dimensional analysis required to translate information on linear-flow experiments to two and three-dimensional radial flow systems encountered in actual practice. A few of these studies deserve mention here, i.e., those involving heat-transfer behavior during ignition of oil sand, temperature distributions in a three-dimensional system, and fluid flow in two-dimensional system.

During the ignition of an oil sand, the transient temperature distribution in the vicinity of the well bore has an appreciable effect upon the liquid-saturation distribution. For example, Fig. 4 shows the temperature distribution in a sand having a thermal diffusivity of 0.023 sq. ft. per hour for one method of igniter operation in which a constant power release of 1.5 kw. per foot of sand thickness is maintained until a temperature of 1,400° F. is reached and thereafter the input power is controlled so that the temperature is held constant at this same value.

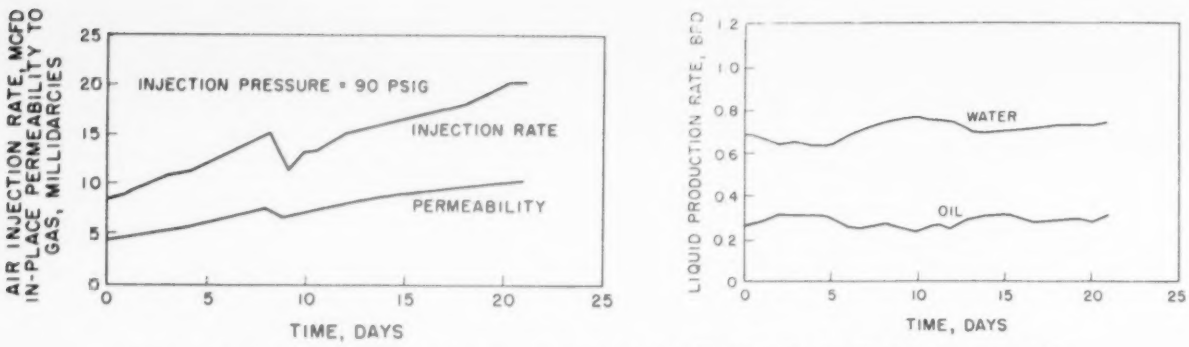


Fig. 6—Conditions and results of air driving from well No. 14 into No. 13, to develop "in-place" gas permeability

On the assumption that a temperature of 400° F. at a radius of 2 ft. from the central axis of the well is required to initiate combustion of the oil sand, it will be noted that a heating period of about 1 week is required. These data are, of course, calculated as though no combustion actually took place in the region shown. Similar correlations for different formation temperatures, thermal diffusivities, and methods of igniter operation have also been developed.

A number of potentiometric model studies for two-dimensional systems were carried out to assist in applying information from linear-flow experiments to the problem of designing and operating larger-scale units in an actual oil field. These studies involved combustion-fluid-flow correlations for two, three, and five-well systems having mobility ratios. $(K/\mu$ for air flow behind combustion front$)/(K/\mu$ for air flow ahead of combustion front), from one to infinity. Important information on pressure distributions, sweep efficiencies, and air-flux distributions around a series of prescribed combustion front locations was obtained from these studies.

Actual Field Investigations

Even though results in the laboratory were encouraging, it was important to determine that oil could be burned in an actual reservoir. At an early date in the development program, preparations were therefore made for doing this. In locating a reservoir suitable for experimental purposes, an extensive survey was made of oil fields located in the Mid-Continent area which were known to contain low A.P.I.-gravity viscous oils at shallow depth. Core-analysis data, electrical- resistivity logs, and oil viscosities from each of a number of different fields were evaluated. On the basis of this evaluation, a small sand lens located at a depth of about 180 ft. and underlying some 30 acres of land in southern Oklahoma was finally selected.

An isopachous map of this sand lens is presented in Fig. 5; the nine core holes shown on this map served to determine both the extent and properties of the sand. At least 5 acres were considered to be of appropriate thickness (15 to 20 ft.). Average properties of the sand and its contained fluids are:

Porosity, per cent	29
Specific permeability to air, md.	2,300
Water saturation, per cent	40
Oil saturation, per cent	60
Gas saturation (est.), per cent	very low
Producing gas-oil ratio	very low
Reservoir temperature, °F.	61
Reservoir pressure, psig.	57
A.P.I. gravity of oil at 60° F.	18.5
Viscosity of oil at:	
60° F., cp.	7,413
100° F., cp.	876
210° F., cp.	35
Salinity of water, p.p.m.	14,266

First experimentation in this sand lens involved establishment of fluid production rates under natural reservoir drive and then under controlled air-injection rates. Oil and water production rates under natural reservoir drive (presumably solution gas) were accurately established by bailing and pumping tests carried out on four wells

(Continued on page 113)

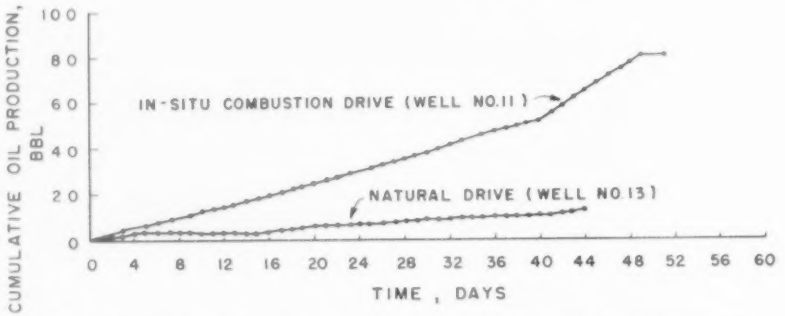


Fig. 7—Comparison of production by natural drive and by in-situ combustion drive.

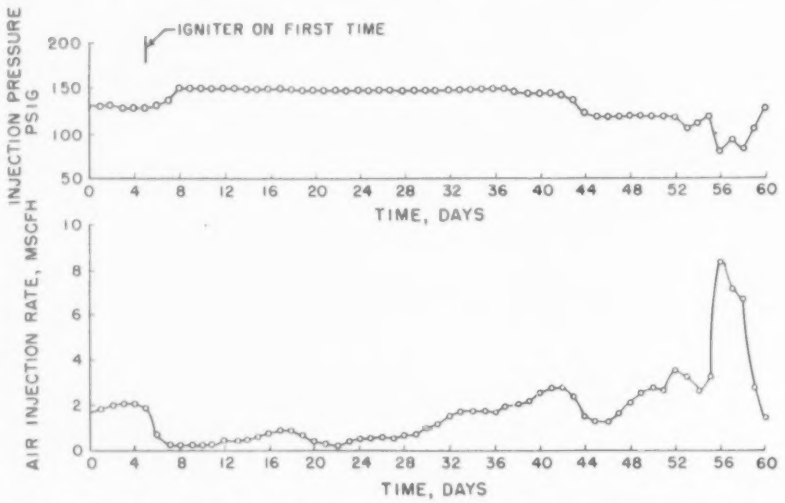


Fig. 8—History of injection rate and pressure for well No. 14 during in-situ combustion test.

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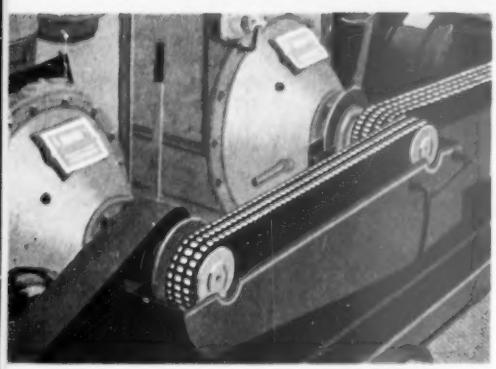

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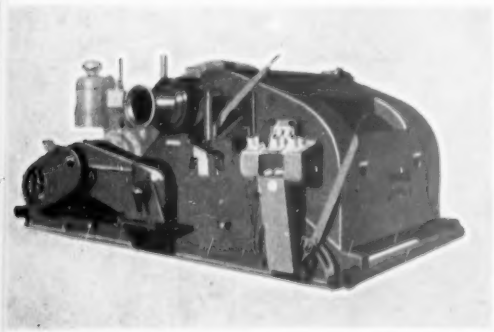

GB-160-T (single drum) torque converter rig, designed for use where sand reel is not required. Its twin is the GB-160-TS (double drum).

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Standard Costs in Drilling Accounting

for

- **Improved bidding**
- **Faster cost accounting**
- **Better control of operational costs**

by E. H. Sloyer

Job No.	Well Name	Company
Rig. No.	Location	Started
Mud Cl.	County and State	Finished

"Casing"	Estimate	Actual	Remarks
Income			
Total Income			
Total Payroll Days			
Total Drilling Days			
Rotary Bits Used			
Expense			
Drilling Labor—Crews			
Teaming and Freight—Trucking			
Fuel—Butane or Diesel			
Water Expense			
Tool Rentals—Testing or Fishing			
Bits and Coreheads, etc.			
Cementing and Casing Expense			
Slush Pond Expense			
Mud Materials Used			
Location Expense			
Miscellaneous Direct Expense			
Total Direct Expense			
Rig Repairs and Supplies			
Supt. and Field Expense			
Total Drilling Expense			
Overhead Expense—Prorated			
Total Contract Cost			
Profit			
Profit or Loss			
Per Cent Profit to Income			
Tool Pusher			

COST SUMMARY used for cost accounting on drilling wells.

STANDARD costs have long been recognized as an asset in the field of industrial accounting, however, they have not been used to a very large extent in the field of drilling contracting.

The application of this type of cost accounting to the drilling industry can be accomplished by merely treating the drilling rig as a factory capable of drilling a hole.

For a number of years it has been common practice of both large and small drilling contractors to record their costs on a job basis. Inasmuch as a good many of the drilling contractors of the industry started as either one-rig or two-rig operators, most of these same companies had little or no bookkeeping or accounting done by company personnel.

Usually these firms either retained a member of an accounting firm to post their records periodically, or in case the firm could afford a full-time bookkeeper, it was the usual practice to have an accounting firm make all financial statements and income-tax returns. Out of this grew naturally, if I may use the expression, "Tax Accounting." There was very little emphasis placed on cost accounting as we know it today, or accounting for the purpose of measuring efficiency in operation.

Income Items

In many respects the contract-drilling business is like most other contracting operations. Basically, we drill a hole for a certain stipulated price per foot. In addition to this, it is the common practice to stop the drilling operations and test a particular drilling horizon that might indicate possibilities of producing oil or gas. Naturally, the contractor would need to be compensated for this time lost from the drilling operation. This is commonly known as day work. Day work is normally priced at so much per 24 hours or so much an hour. The only other form of income used in the average contract is a return of cost to the contractor of certain supplies that are normally furnished by the owner of the lease. Actually, the income and accounts-receivable problems are very few, since there are usually only one or two invoices necessary to cover the entire job.

Investment Range

The contractor's investment is a big item. A rotary rig capable of drilling a 5,000-ft. hole would cost anywhere from $150,000 to $250,000, depending on the size and amount of the specific equipment desired. The deeper the rig is designed to drill, the higher the cost. Actually, rigs can be purchased that cost as much as $1,000,000, such as the big barge rigs that are found around the Gulf Coast or in areas where the drilling is below 15,000 ft. Because of the high cost of equipment, depreciation on either cost or replacement value becomes a very important factor

"The accountant is often asked for faster and more accurate reports by his managers or supervisors. Instead of saying that it cannot be done without additional information from the field, or that the shop or field does not get information in soon enough, let's take a good look at our own accounting system. See if it can't be changed a little, to produce the results desired, with the minimum amount of demands on others."

and its importance as a real cost cannot be overemphasized. This brings us to the discussion of costs which are the major problem of any and all drilling contractors.

Basic Control Accounts

Without disrupting any form of accounting that might be used, in my opinion, it would be easy to rearrange the accounts so that the control accounts could reflect:

First, the costs that should normally be charged direct to the jobs;

Second, the other expenses such as repairs, supplies, etc., necessary to keep the rig in operation;

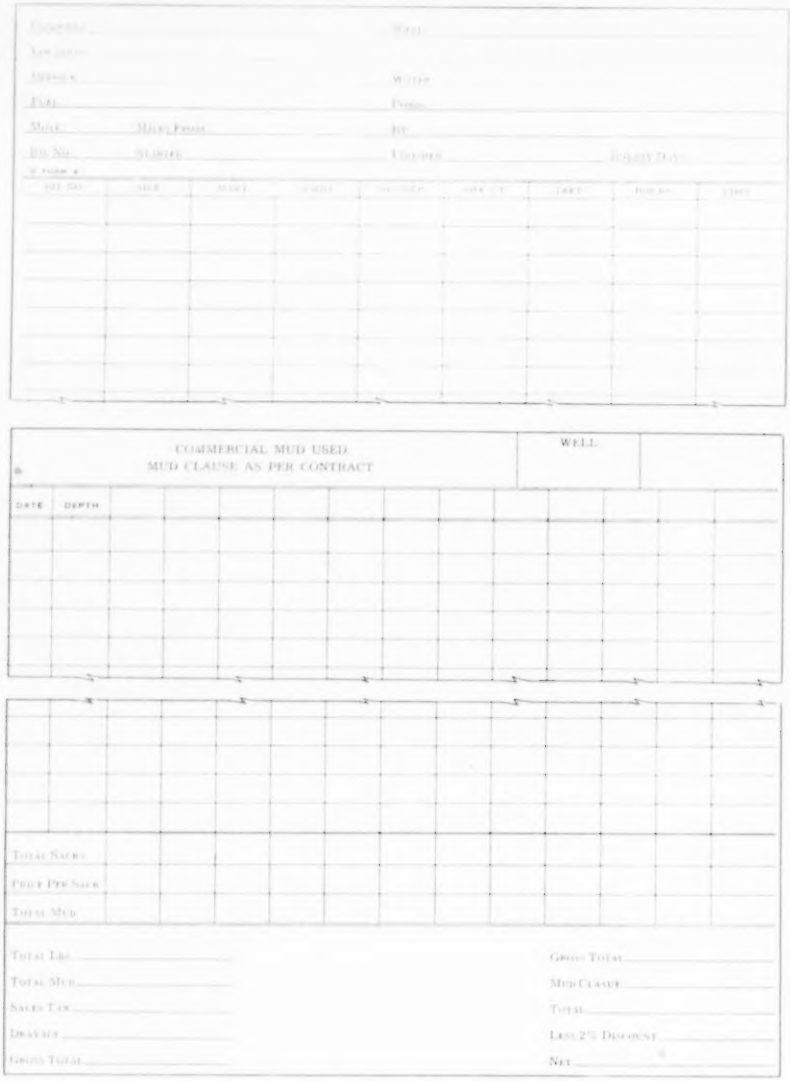
Third, the cost of field supervision, such as tool pushers and their cars and expenses, along with the cost of operating a shop or yard; and

Fourth, the overhead items such as officers' or managers' salaries and wages, office expenses and depreciation.

Example, the list below is the chart of expense accounts of an average drilling contractor. No attempt has been made to list these accounts in any particular order.

Drilling labor	Supt. salaries and wages
Labor other	Shop salaries and wages
Payroll taxes	Hauling to yard
Payroll insurance	Shop expense (lights, water and heat)
Hauling and trucking	Shop supplies
Drilling-engine fuel	Supt. travel expense
Water expense	Auto and truck expense
Special-tool rentals	Depreciation expense
Bits and core heads	Managers' salaries and wages
Casing and cementing	Office salaries and wages
Slush-pond expense	Postage and freight
Mud materials used	Office (heat, light and fuel)
Location expense	Office rent
Miscellaneous expense	Office supplies
Field-repair labor	Fire insurance
Field labor other	Personal-property taxes
Stacking expense	Travel and entertainment
Gasoline, oil, and grease	Telephone and telegraph
Small tools and supplies	Legal and professional
Wire rope used	Contributions and donations
Draw-works repairs	
Rotary-table repairs	
Swivel repairs	
Drill-pipe repairs	
Drilling-engine repairs	
Light-plant repairs	
Water-pump repairs	
Mud-pump repairs	
Mud-pump supplies	
Repair welding	

The expense accounts listed above should be classified under separate control accounts. The choice of control and subsidiary accounts would depend upon the problems and conditions of a particular company. The following classifications are given as examples for illustration only, and are not intended as classifications suitable for all systems:



MUD AND BIT records used for cost accounting when drilling wells. Bit record is at top.

CONTROL 1—DIRECT EXPENSE

Drilling labor	Casing and cementing
Direct labor other	Slush ponds
Hauling and trucking	Mud materials used
Water expense	Location expense
Special-tool rentals	Miscellaneous direct expense
Bits and core heads	

CONTROL 2—INDIRECT RIG EXPENSE

Repair labor	Drill-pipe repairs
Labor other (indirect)	Drilling-engine repairs
Stacking expense	Light-plant repairs
Gasoline, oil and grease	Water-pump repairs
Small tools and supplies	Mud-pump repairs
Wire rope used	Mud-pump supplies
Draw-works repairs	Repair welding
Rotary-table repairs	Depreciation—rig
Swivel repairs	Insurance expense
	Miscellaneous rig expense

CONTROL 3—SUPERINTENDENT AND FIELD EXPENSE

Supt. salaries and wages	Shop supplies (tools, etc.)
Shop salaries and wages	Auto and truck expense
Hauling to yard	Depreciation—Auto and truck
Shop expense (heat, light, and water)	Miscellaneous Supt. and field
Supt. travel expense	

CONTROL 4—OVERHEAD

Manager salaries and wages	Travel and entertainment
Office salaries and wages	Telephone and telegraph
Postage and freight	Legal and professional
Heat, light, and water	Contributions and donations
Office rent	Depreciation—office expense
Office supplies	Miscellaneous administrative and general
Insurance expense	
Personal-property taxes	

Control 1. Here are listed such items as direct drilling labor, hauling expense, water expense, special tools, etc., all of which have a direct tie to the one particular job and it is natural to

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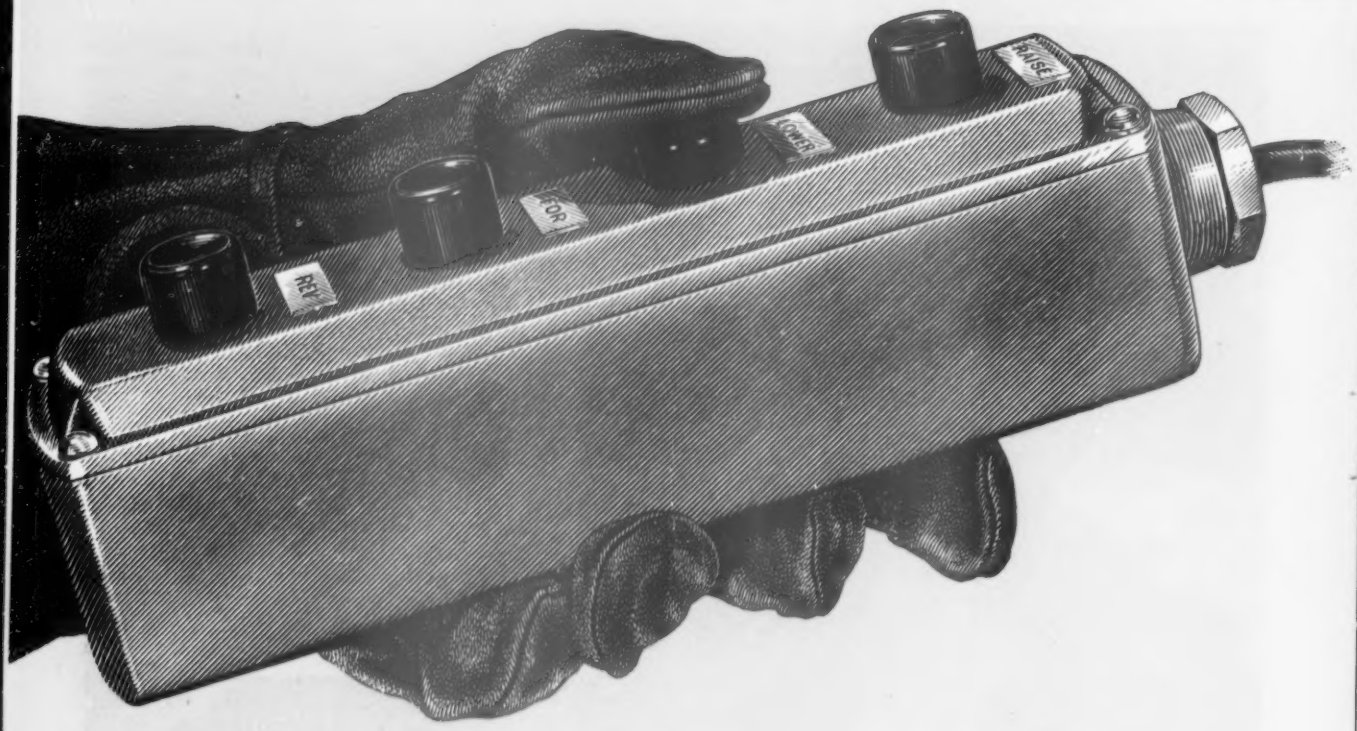

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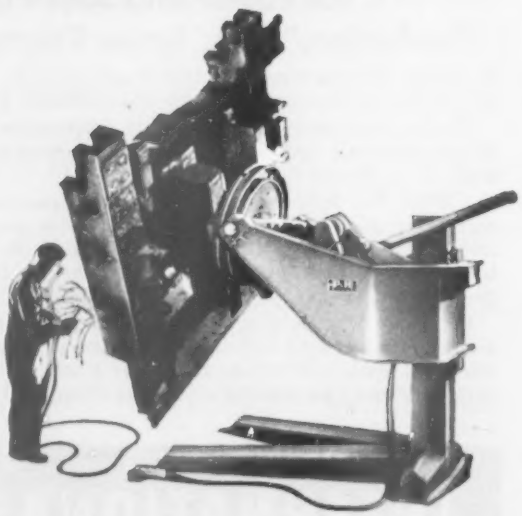

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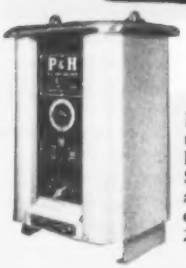

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assume that they should be charged directly to the job. Each account will be covered in detail later in the discussion of the direct charges.

Control 2 consists entirely of expenses that have to do with the operation, and maintenance, along with the repair of the drilling rig and its various parts. It is this list of accounts with which most contractors have the greatest difficulty in getting distributed equitably to the various jobs. It is natural to assume that none of the equipment actually wears out entirely on any one job. If this is the case, it follows that the cost of supplies and repairs should be spread over all of the jobs if possible.

It it is found that certain items in Control 2 are used completely or worn out on the job, it is simple to change that item or expense from the indirect to the direct classification. One should always keep in mind, however, that if it proves to be just as convenient to handle the item as an indirect expense rather than a direct expense, it will speed up considerably the cost accounting at the completion of the job, by making an indirect charge out of the item in question. Reference is being made to such items as drilling fuel and small tools and supplies.

By treating all such items in the Control 2 as the cost of operating the rig, it does take but a short time to gain enough experience to be able to charge the entire cost of all the accounts as one figure. This can be done better on an "operated day basis," or a "footage drilled basis," whichever proves more satisfactory to the particular drilling company.

Footage basis is quite satisfactory if a company is engaged in drilling most of its wells in a fairly concentrated area, the wells are all about the same depth, and the operators are requiring about the same amount of testing or day work.

Operated day basis, or charging the indirect expenses to the job, works much better for companies which have a wide variance in their operations, and especially if they drill wells for several different operators. By letting the expenses accumulate in the control account by rigs, and then dividing the total of all such expenses by the total number of operated days that the rig has actually drilled, a "cost per day" figure is computed. This figure can be charged back to the job by multiplying the "cost per day" by the number of days the rig spent on that particular job. It is also possible to go back over past years' experience, reclassifying the expenses in the manner shown above, and getting the benefit of any experience that any rig may have had prior to installing the indirect system of costing.

One of the remarkable features of this type of cost accounting is that in addition to speeding up the costing of a completed job, it creates a very good cost control of the actual performance of the equipment. By using this running list of costs it is possible to sit down with your field superintendent or tool pusher, and go over very effectively each item of cost on any one or all of the rigs. To be successful a system of this type needs careful observation.

Rig depreciation is one item included in this type of control. This has been done on the assumption that depreciation is figured on a "use life" basis. If some other basis is used in computing depreciation, such as the "straight-line method," it probably will be best to classify the depreciation expense in Control 3 or 4. It is possible to treat depreciation as a separate control entirely and spread the cost to the jobs on some other equitable basis. Since in itself, the handling and charging of depreciation is an almost inexhaustable subject, no attempt is made to discuss it in detail here.

Control 3 contains all items such as superintendents' salaries and expenses, auto and truck expense, shop or yard expense, and any other items that fall naturally into this classification. All of these items could easily be thought of as overhead costs, but it is believed a better control is created if such field or supervision expenses are separated from those normally classified as overhead. This type of expense can be charged back to the job on a "cost per day" basis, very similar to the method mentioned above.

THE AUTHOR

E. H. Sloyer is secretary-treasurer of R. W. Rine Drilling Co., Wichita, Kans., and has been with this company since 1945. Prior affiliations have been with Ford Motor Co., Dwight Cheese Co., and General Tire & Rubber Co. He also served with the Armed Forces during World War II.

Inasmuch as practically all of the expenses included in this control are fixed or at least temporarily fixed, by the month of year, it is usually found to be more equitable to charge these costs back to the job on an over-all day basis or payroll day basis. There are usually several days' difference in the actual operated days on a drilling job and the over-all days or payroll days, due to (1) the time necessary to set in and rig up the tools, (2) the waiting on cement to set, and (3) the time necessary to tear down and set out the tools at the completion of the job. Some contractors have gone so far as to consider and classify these expenses as purely fixed, along with the overhead, and charge them off each month. Their operating statements then reflect only the income less direct and indirect expenses.

If it is advantageous for the accountant to show management a figure that represents the difference between the total cost of supervision and the amount that has been allocated or absorbed, he can do so easily by letting this difference "ride" in the control. It is customary, however, to put tool pushers or superintendents back to drilling if the work slacks off enough to accumulate a very large unabsorbed cost of this nature.

Control 4 consists of all of the various accounts that are normally considered as strictly overhead items of expense. Here again, the entire total of this control can be distributed on any one of several direct or indirect methods of allocation. Or, it can all be handled as a fixed charged to be deducted from operating profits after all other expenses have been applied. The accountant should select the method of handling the expenses listed in Controls 3 and 4, that reflect costs and profits in the manner best suited to his firm.

The increase of speed in the cost accounting of a system of this kind comes from its simplicity. When it comes time to make a bid on a drilling contract, the manager and his accountant or bookkeeper considers only a few important factors instead of a list of 50 or more items. As an example, let us assume that we did have our accounts set up in a manner similar to those in the control accounts. By referring to this list, we find in Control 1 that we have first—**drilling labor.** From the contractor's past experience or from the experiences of others who may have drilled in the area, or even similar areas, he can make a fairly accurate estimate of the number of days it will take to complete the job.

Next we have **hauling costs.** By knowing the weight of the rig, the number of miles it has to be hauled, etc., the moving cost can be determined by using the trucker's tariff rates that apply to the local area. Then by adding the normal cost of the setting in and rigging up done by the trucks, one has an accurate trucking cost.

Following this, is **water expense.** This is a cost that must be determined for each job. It takes a lot of water to drill a test well anywhere. An average water well as we think of it will not ordinarily furnish enough water. Because of the very large amount needed to complete the job, it is usually necessary to determine if a special water well can be drilled in that area. If water is not obtainable this way, it must be secured from either a pond, river, or city supply.

Next is the **special tool rentals.** This is simply what the name implies. It is not at all unusual for an operator or company to require a special tool that the drilling contractor does not have. If this is the case, it is easy to determine the cost of this tool on a rental basis once the requirement is made.

After this is the cost of **drilling bits and core heads.** These are the tools that actually cut the hole. They are expensive and are completely worn out before they are pulled out of the hole and a new one put on in its place. The estimating of the number of bits to be used is done by the same methods applied to direct drilling labor. If there is not any previous experience available, the contractor must use his knowledge of drilling and the rate of penetration per bit of the various formations that are expected to be encountered. He then estimates the tops of the formations and by applying this rate of penetration experience per bit, he can estimate the number of bits required.

The account called **cementing and casing expense,** is not used very much in connection with straight contract drilling. It is, however, an important account if the contractor is asked to furnish any of the various strings of surface pipe that are normally run in any drilling well. The cost of these items is determined by the size, weight, and length of pipe required, and it is simple to arrive at an accurate figure when the requirements are known.

The cost of digging the pits is **slush-pond expense.** This is usually done by an independent dirt-moving contractor, whose prices are fairly standard for most jobs. These pits are used to mix with water the mud that is used in the hole. They are also used as a method of separating the cuttings that are washed out of the hole from the drilling mud.

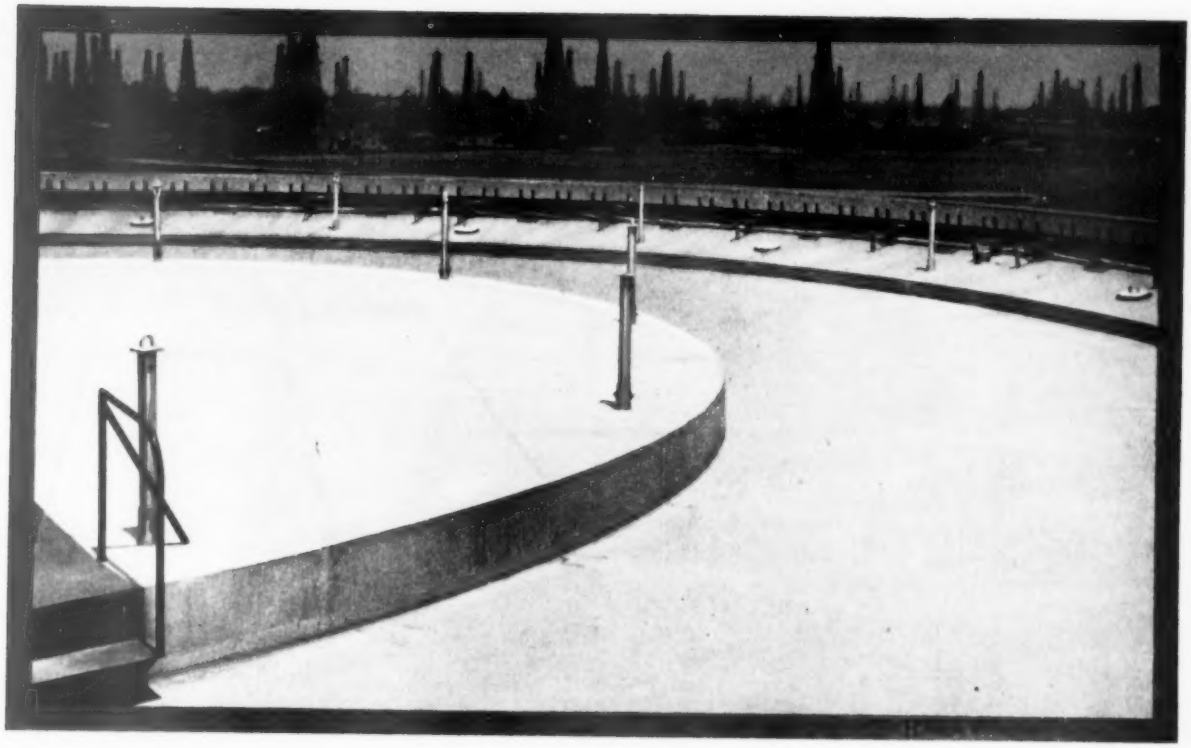
The actual cost of the **commercial mud** that is to be used is another item to be covered. This cost varies considerably from one area to another. Also, it is almost entirely controlled by the company for which the contractor is drilling the well. Since this is the case, it has become standard practice for the operator or company to furnish all or nearly all of such mud or chemicals. The use of this account thus has become mostly a clearing account for the contractor. It is the feeling of most contractors that if they are asked to buy the mud and later pass it on to the company with their invoice for the drilling of the well, it should be included in his costs and profit figured on the same. If the contractor does not wish to make a direct expense out of this account, he should at least figure something in his costs for the handling of the material and for the interest on his money which is tied up for 30 to 90 days.

The expense account for **location** represents the cost of leveling the drilling site, building roads if necessary, and any other cost of dirt work that would not ordinarily be charged to the slush-pond expense. Contracts vary extensively on this point—all the way from the contractor furnishing all the dirt work to the company paying for the entire cost. This being the case, an account must be provided. If the contractor is to do all the dirt work, he should send one of his men to check the location and thereby get an estimate of the dirt work necessary.

After adding any other **miscellaneous direct cost** that might be required by the particular contract, a list of only 10 expenses has had to be estimated before making the bid. Inasmuch as the over-all days and the operating days have been estimated, the amount of rig expense that should be charged to this job is determined by multiplying the rig expense per day figure by the estimated days required to drill the well. The same procedure can be followed for the superintendent and field expense, and overhead. By this method, the accountant has to work with only 13 accounts instead of 50 or more. In addition to the time saved in preparing the estimate or bid, this method creates a far more accurate figure, having eliminated all but two or three possible contingencies, which are days, bits, and mud.

The next big advantage of this type of a system is the speed with which costs can be determined at the completion of the well. Ordinarily it takes from 30 to 90 days after a well has been drilled to get all of the charges and expenses in so they can be charged to the job. The use of a system like this makes it easy to know exactly what the well cost is within a few days after the well is finished.

The third advantage of this type of system, as mentioned before, is the splendid cost control that it creates.



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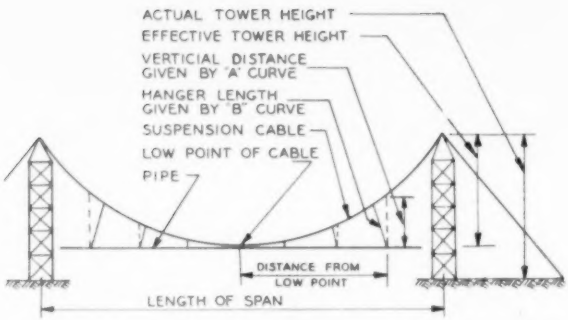

Fig. 1—A sketch showing the component parts of a pipe-line cable suspension and various terms used in connection with the chart.

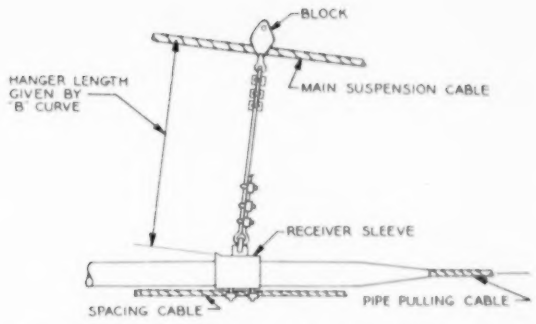

Fig. 2—Typical hanger assembly. Spacing cable holds receiver sleeve in alignment and also at correct interval.

Handy chart aids in

Solving Pipe-Line Suspension Problems

and restoring flood-interrupted service

by C. A. Sweningsen*

PRACTICALLY all pipe-line river crossings may at some time be exposed to the ravages of the river at flood stage. In the event of loss of the crossing, speedy restoration to service by expedient means is imperative.

Perhaps the most practical method for restoring service rapidly is by erection of a cable suspension system to support the new pipe. Another method sometimes used is the dragging of pipes across the bed of the stream by means of an endless cable loop. This type of crossing, however, is restricted by the width of the stream and the current speed.

This method and the chart which summarizes it were developed by Southern Counties Gas Co. The chart (Fig. 3) has been made a part of the company's emergency manual. Use of the chart allows field construction personnel quickly to solve suspension problems with little engineering aid.

The chart has been used since its development for several practice pipe-line suspensions, and recently for the design of a 660-ft. emergency crossing of the Santa Ynez River near Lompoc.

Design chart . . . A pipe line cable suspension (see Fig. 1) consists of the following component groups:

1. Two towers with supporting base structure and guy lines.
2. Suspension cable with dead-man at each end.
3. Suspender hangers supporting the pipe from the suspension cable.
4. Pipe line.

When designing a suspension span, the engineer is initially confronted with combinations of variables. The variables are span length, effective tower height, and cable size. Pipe size and weight may be another. Because of the several variables there are several solutions, and to determine the best solution can involve long, time-consuming calculations.

Crossings Chart

Fig. 3 shows a chart which may be used for quickly solving a number of problems related to required suspension cable size, tower height, length of suspender hangers, etc.

Each of the A curves running from upper right to lower left on the chart gives the height at any point on a cable supporting a uniform load with a given ratio of cable tension to unit loading. At any point on one of these curves, the horizontal distance from the low point of the cable is read along the top or bottom of the chart, and the vertical distance from the same point is read on the righthand side. In practice, the low point is taken as the point where the cable comes nearest to the pipe. This is not the lowest point if the pipe slopes. For a symmetrical span it is the center of the span.

The B curves, which are shown in broken lines branching off from each A curve, give the length of suspender cables or hangers if they are free to move on the main suspension cable. The lower portions of the A and B curves are identical. At any point on one of these B curves, the horizontal distance from the low point of the cable, measured along the pipe, is read at the top or bottom of the chart.

The length of the hanger which is attached to the pipe at this point is then read on the right-hand side. This assumes that the hanger at the low point is of zero length, that is, that the cable comes all the way down to the pipe at this point. Otherwise, the length read from these curves is approximately the length by which each hanger exceeds the length of the shortest hanger.

In general, it will be found in using the chart, that new A curves and B curves will have to be drawn between those originally on the chart, parallel to the nearest existing A or B curve.

Cable and pipes . . . The lines running from upper left to lower right on the chart, and marked with various cable sizes, represent the strength of the respective cables. The breaking strength of these cables, in tons, may be read on a vertical line drawn from the 15-ft. mark at the top of the chart. (For example, the breaking strength of 1¼-in. cable is 64 tons).

*Southern Counties Gas Co. of California. Paper presented at meeting of Pacific Coast Gas Association, Santa Barbara, Calif., May 1953.

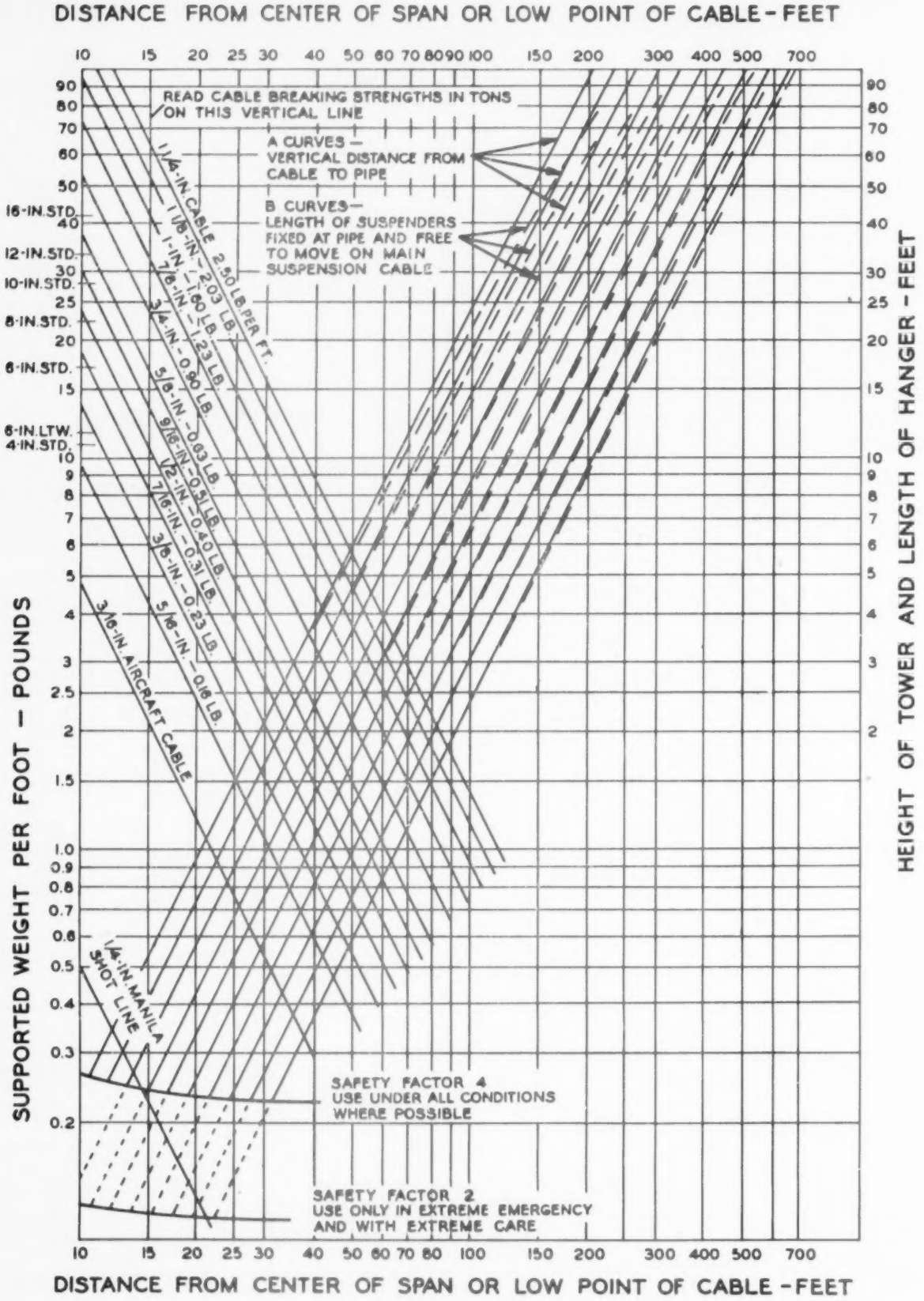
DISTANCE FROM CENTER OF SPAN OR LOW POINT OF CABLE - FEET
10 15 20 25 30 40 50 60 70 80 90 100 150 200 300 400 500 700
READ CABLE BREAKING STRENGTHS IN TONS ON THIS VERTICAL LINE
A CURVES — VERTICAL DISTANCE FROM CABLE TO PIPE
B CURVES — LENGTH OF SUSPENDERS FIXED AT PIPE AND FREE TO MOVE ON MAIN SUSPENSION CABLE
1 1/4-IN. CABLE 2.50 LB. PER FT.
1 1/8-IN. — 2.03 LB.
1-IN. — 1.60 LB.
7/8-IN. — 1.23 LB.
3/4-IN. — 0.90 LB.
5/8-IN. — 0.63 LB.
9/16-IN. — 0.51 LB.
1/2-IN. — 0.41 LB.
7/16-IN. — 0.40 LB.
3/8-IN. — 0.31 LB.
5/16-IN. — 0.23 LB.
3/16-IN. — 0.16 LB.
3/16-IN. AIRCRAFT CABLE
1/4-IN. MANILA SHOT LINE
16-IN. STD.
12-IN. STD.
10-IN. STD.
8-IN. STD.
6-IN. STD.
6-IN. LTW.
4-IN. STD.
SUPPORTED WEIGHT PER FOOT — POUNDS
HEIGHT OF TOWER AND LENGTH OF HANGER - FEET
SAFETY FACTOR 4
USE UNDER ALL CONDITIONS WHERE POSSIBLE
SAFETY FACTOR 2
USE ONLY IN EXTREME EMERGENCY AND WITH EXTREME CARE
DISTANCE FROM CENTER OF SPAN OR LOW POINT OF CABLE - FEET

Fig. 3—Chart for pipe-line cable suspension.

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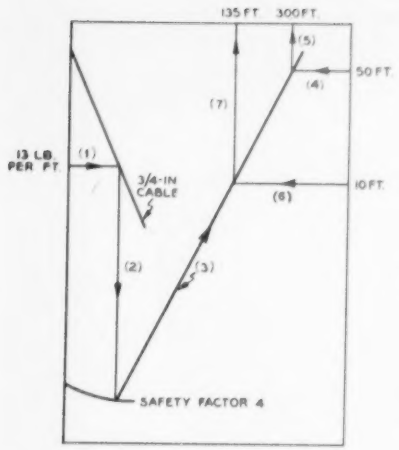

Fig. 4—Using chart to select cable size and tower height.

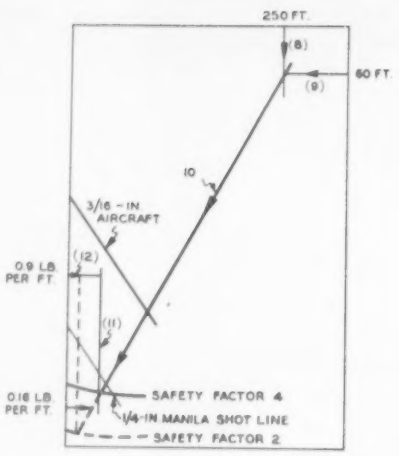

Fig. 5—Using the chart to select size of pulling line.

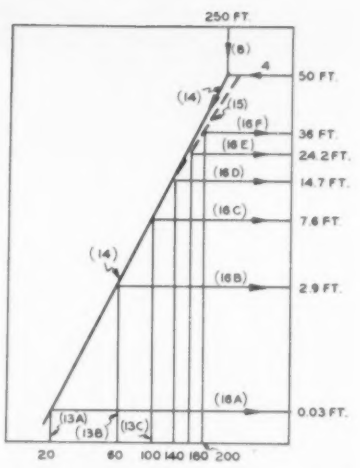

Fig. 6—Using chart to determine length of each hanger.

Most of these lines are drawn to represent the breaking strength of new wire rope of the highest grade made. If some other cable is available, a new line may be drawn for it parallel to the existing lines and crossing the 15-ft. line at a point where the vertical distance read on the left hand side of the chart is equal to the breaking strength of the cable in tons. The weight per foot for various sizes of cable is given adjacent to the cable size.

Unit loads . . . The scale on the left-hand side of the chart shows the size of the pipe carried by the suspension cable (when the weight of the cable suspended is neglected), and also shows the load in pounds per foot. The weights of various standard pipe and a special 6-in. lightweight pipe are marked on this scale. At any point on one of the lines representing cable strength, where the vertical position is unit weight carried by the cable, the horizontal position is a function of the cable tension and weight. This horizontal position will determine the shape of the curve taken by the cable.

A vertical line is drawn to meet the curve "safety factor." From this point a new A curve is drawn which represents the sag with the cable working at a factor of safety of four. This is the minimum factor of safety for all ordinary conditions.

Using the chart . . . The use of the chart will vary, depending upon what conditions are known and what ones are to be determined. In a typical case, the length of the span, weight of the pipe to be supported, and the available suspension cable may be known. In this case, the procedure is as follows: Draw a horizontal line representing the weight to be supported to intersect the line for the cable strength. From this intersection, draw a vertical line to intersect the curve Safety Factor 4.

From this intersection a new A curve is drawn. The length to be supported by one tower is found at the top of the chart, and a vertical line drawn to intersect the A curve just drawn. From this intersection, a horizontal line is drawn to the right hand side of the chart and the required cable sag is read. Any of these operations may be performed in the reverse direction. The following example will illustrate the use of the chart for a typical case.

Typical Problem

A temporary span is to be installed where the distance between the towers is 500 ft. Six-inch lightweight pipe is to be installed, weighing 11.6 lb. per ft. We have available 1,500 ft. of ¾-in. Blue Center hoisting rope and a ⅞-in. Blue Center winch line. The Lyle gun will shoot ¼-in. manila rope or ⅜-in. aircraft cable. The cable may be supported either on 60 ft. towers or 20 ft. A-frames, the A-frames being easier to erect. The pipe is to be kept 10 ft. above the level of the bases of the towers. Suspenders are to roll along the main cable without restraint, and be fixed to a cable at intervals along the pipe.

Suspension cable and towers (see Fig. 4) . . . The ¾-in. cable may be used either single or double for supporting the pipe. A trial will be made to determine whether a single ¾-in. cable is sufficient. The weight of the pipe is 11.6 lb. per foot, and the weight of the ¾-in. cable is 0.9 lb. per foot. This makes a total of 12.5 lb. per foot. We will assume that with the weight of the suspenders and fittings, the total weight will be 13.0 lb. per foot. Read 13 lb. per foot on the left hand side of the chart and draw a horizontal line (1) to meet the diagonal line for ¾-in. cable.

From this point, draw a vertical line (2) to meet curve Safety Factor 4. From this point, draw a diagonal line (3) toward the upper right parallel to the A curves. The available height of the tower is the actual height minus the 10 ft. by which the pipe is to clear the normal ground level. For the 60 ft. tower this is 50 ft. Find 50 ft. on the right-hand side of the chart and draw a horizontal line (4) to intersect line (3). Draw a vertical line (5) from this intersection and read 300 ft. at the top of the chart.

This is the maximum length of pipe which can be supported from the 60 ft. tower with this cable, under these conditions. Thus, two 60-ft. towers can support a 600-ft. span with a single ¾-in. cable. The available height of the 20-ft. A-frame above the pipe is 20 minus 10, or 10 ft. Find 10 ft. on the right-hand side of the chart and draw a horizontal line (6) to meet the diagonal line (3) as before. From this intersection, draw a vertical line (7) and read 135 ft. at the top of the chart. This is less than half the span, therefore, it is not possible to use two A-frames.

A 60-ft. tower on one side and a 20-ft. A-frame on the other side will carry a span of 300 plus 135 or 435 ft. on one ¾-in. cable. This is insufficient. The choice, then, is between using 60-ft. towers on both sides, with a single ¾-in. cable, or a 60-ft. tower on one side, and a 20-ft. A-frame on the other with a double ¾-in. cable. For the purpose of this illustration, we will choose two 60-ft. towers and a single ¾-in. cable. The span is then symmetrical. If two cables were to be used, the problem should be solved as

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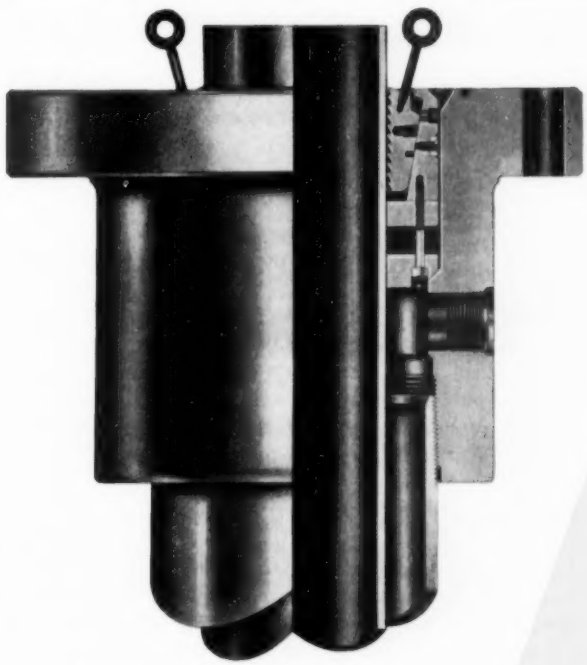

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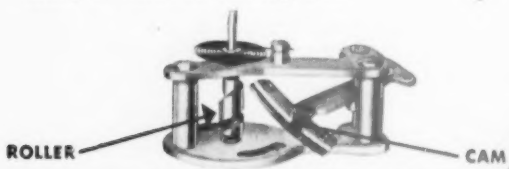

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for one cable carrying half the weight of the pipe.

Stringing suspension cable (See Fig. 5) . . . Since each tower is to support 250 ft., find 250 ft. at the top of the chart, and draw a vertical line (8). We will assume that the cable may sag to the ground level during installation, but no lower. Therefore, the available height of the tower for this operation is 60 ft. Find 60 ft. on the right-hand side of the chart and draw a horizontal line (9) to meet the vertical line just drawn. From this point, draw a diagonal line (10) toward the lower left parallel to the A curves, and intersect curves Safety Factor 4. From this intersection draw a vertical line (11).

In this case the weight per foot to be supported is the weight of the ¾-in. cable, or 0.9 lb. per foot. Find 0.9 on the scale at the left-hand side of the chart, and draw a horizontal line (12) to meet the vertical line just drawn. This intersection lies between the lines for ⅝-in. aircraft cable and ¼-in. manila shot line. This indicates the manila shot line is not strong enough to pull the ¾-in. cable. In this case, we know that no real hazard to expensive equipment is involved. It may be permissible to reduce the safety factor on the manila shot line if more line is available for a second trial. Assuming this is the case, we may extend the diagonal line (10) down to meet the curve Safety Factor 2, and draw a vertical line for a new trial on the ¼-in. manila shot line.

The intersection of this line and weight 0.9 lb. per foot is still considerably above the strength of ¼-in. manila, therefore, the ¼-in. manila can not be used to pull the ¾-in. cable. The choice then is between ⅝-in. aircraft cable or the ⅝-in. winch line. We will use the ⅝-in. winch line and determine if it can be pulled across by the ¼-in. manila. The weight of the winch line is 0.16 lb. per foot. Find 0.16 lb. per foot on the scale on the left-hand side of the chart and draw a horizontal line to meet the vertical line (11). This intersection is below the strength of the ¼-in. manila line, therefore, it is sufficiently strong to pull the ⅝-in. winch line.

Hangers (see Fig. 6) . . . Since it is advantageous to make all the hangers as short as possible, we will assume the cable touches the pipe at the center. Hangers will be spaced at 40-ft. intervals along the pipe, the first one being 20 ft. from the center of the span. The second will be 60 ft., the third 100 ft., etc. Read each of these distances at the bottom or top of the chart, and draw vertical line (13A), (13B), etc. Extend line (4) to intersect line (8). From this intersection draw a

diagonal line (14) to lower left parallel to A curves.

Intersections of this line with the vertical lines (13A), (13B), etc., give the vertical distances from the pipe to the main suspension cable. In this problem, however, these distances are not quite the true lengths of the hangers since they are free to move along the suspension cable, and thus find the shortest distance from the pipe to the suspension cable. Draw a B curve (15) branching off from line (14) which is similar to the B curve next to it. Curves (14) and (15) are identical below the point where (15) branches off.

From the intersections of curve (15) with lines (13A) (13B), etc., draw horizontal lines (16A), (16B), etc., and read the hanger lengths on the right hand side of the chart.

Designing the Towers

An A-frame is one method of providing a simple tower which is portable and easily erected.

Where the required tower height is above 40 ft., calculations will show that the column loadings on the A-frame legs become excessive unless large-diameter pipe is used for the legs. A fabricated framework type of construction should then be considered.

Where it is anticipated that towers of this type will be required, the engineering design, and usually the fabrication of the tower, should be completed before any emergency arises where their use is required. Design considerations for a tower of this type should include light weight, portability, and facilities to provide ease of erection, in addition to that of strength.

When possible the tower should have a sheave mounted at the top to support the main suspension cable. The sheave will provide a radius to prevent bending in the strands of the cable, and the sheave groove will prevent the cable from flattening and reducing its rated strength.

A hinge-type connection between the bottom of the tower and the tower base or grillage will aid in raising the towers by providing a pivot point during erection. The grillage for the tower base should be capable of evenly distributing the tower load to the soil. Design values for soil bearing should be kept low, and care must be taken in the site preparation so that the base when installed will have good bearing on firm earth and will be level.

Installing the Crossing

A well-planned procedure for installing the suspension crossing will save time and headaches at the job site. The procedure may vary with the design, location, and stream conditions. Listed below is one suggested procedure which requires stringing the pulling cable across the stream but once, and also has the advantage of completing the crossing with only two pulls; one for the cables, and one for the welded pipe string:

1. Prepare site for tower base and install necessary deadmen for tower guys and main suspension cable. If brush is growing on banks of stream in front of towers, clear it away.

2. Erect and guy towers.

3. Prepare suspender hangers to predetermined length with upper end tied to pulley, and lower end tied to pipe receiver sleeves.

4. String pulling cable across river. String pulling cable over the top of the far shore tower.

5. String main suspension cable over top of near shore tower and thread in through each hanger pulley in correct order on the stream side of the tower.

6. Thread pipe pulling cable through each sleeve of each hanger. Prepare to string hanger spacing cable.

7. Connect up the three cables (main suspension cable, pipe-pulling cable, and hanger-spacing cable) through a yoke to the pulling cable. Note: The three cables should not be connected together at one common point—otherwise they are likely to twist together when being pulled across the stream.

8. Start to pull the three cables across the stream. Note: Provision must be made to brake the main suspension cable as it pays out.

9. After the cables have paid out a minimum of the distance from the far tower to the first hanger plus the amount required to tie and anchor the hanger spacing cable at the far side, the hanger sleeves are clipped down to the spacing cable at their correct intervals. The hangers are thus pulled out as the three cables are being pulled across.

10. Upon arrival at the far shore the cables are unclipped from the yoke, and the main suspension cable is lifted over the tower and fastened to its deadman. The other two cables are temporarily anchored.

11. The near-shore end of the main suspension cable is now anchored. The low point of the suspension cable in its unloaded position should be adjusted somewhat higher than its final designed loaded position before it is anchored and clipped. This is necessary because the cable will stretch and lower as the weight of the pipe loads it. The exact correction can be determined by calculating the strength in the cable and the effect of this length on the catenary. However, a rule of thumb can be applied that the low point of the loaded cable will sag about 1 ft. per 100 ft. of span beneath its unloaded position.

12. With the suspension cable in position, the hanger spacing cable may now be adjusted horizontally so that the hangers are in their correct locations, and this cable is then anchored.

13. The suspension system is now ready to take the pipe (see Fig. 2). The pipe string is welded up behind one tower, the front end attached to the pulling cable through a pointed bullnose, and the pipe is then pulled out by the pulling cable onto the suspension, through the hanger receiver sleeves, and across the stream.

Practice drills are essential to develop and prove installation procedures.

In-situ Combustion

(Continued from page 96)

over a period of 2 months; these rates averaged 0.3 bbl. per day of oil and 0.8 bbl. per day of water. Air injection at 90 psig. produced no change in the oil-production rates. This can be seen from the data given in Fig. 6, which show results of air injection into well No. 14 and air and liquid withdrawal from well No. 13 located 40 ft. away. It will also be noted that a substantial increase in the effective permeability to air between these two wells, i.e., from 3 to 13 md., was realized over a period of 23 days of air injection. Upon reaching the value of 13 md. for in-place permeability to air, which was considered adequate for maintaining the required air flow during ignition of the sand, the air-injection test was terminated and the first combustion test initiated.

Primary objectives of the first combustion experiment in the field were to test the operation of specially designed electrical ignition equipment and to assess the ease with which combustion could be initiated and maintained in an actual oil sand. The same wells (Nos. 13 and 14 located 40 ft. apart) and the accessory equipment employed during the air injection test were used in the combustion test. Well 11, located halfway between Wells 13 and 14, was also employed in the test.

Ignition of the oil sand was accomplished through the use of a specially designed electrical resistance-type heater enclosed in a stainless-steel tube 4 in. in diameter and 34 ft. long. This igniter was lowered into Well 14, which had been completed through the oil sand with a slotted 7-in. metal liner. It was necessary, therefore, that heat be transferred to the oil sand through both the igniter shell and the liner. Air injection was, of course, continued throughout the test. Carbon dioxide was detected in the produced gas from Well 13 approximately 5 hours after the igniter was first turned on. Break-

through of the combustion front into Well 11 (20 ft. from Well 14; see Fig. 5) occurred about 55 days later, accompanied by the appearance of steam, smoke, and soot.

A comparison of cumulative oil production histories for natural drive and in-situ combustion drive is shown in Fig. 7; this is believed to constitute a valid basis of comparison, inasmuch as the oil-production rate under natural drive was verified by tests made on three other wells in the reservoir, and because, as mentioned previously, little or no effect of air drive alone on oil-production rate has been observed in this pool.

The advance of the combustion front in this experiment was not continuous, and periodically there was evidence that active burning may have actually ceased. However, in such instances combustion was always reestablished by appropriate manipulation of the igniter "on" and "off" periods in relation to the changes observed in air-injection rate at constant-injection pressure.

It is believed that this technique of igniter operation assisted in dispersing blocks of high liquid saturation built up in the vicinity of the injection well. Further study of this problem is planned during the course of a forthcoming experiment using a five-spot well pattern.

The histories of injection pressure and injection rate for Well 14 are shown in Fig. 8. It will be noted that the air-injection rate dropped off rapidly immediately after the igniter was turned on and remained low for a considerable period in spite of the injection pressure having been increased from 130 to 150 psig. The latter value was considered to be the safe maximum operating pressure for a depth of 180 ft.; therefore, Well 11 (located 20 ft. from the injection well No. 14 on a line with Well 13) was opened up as a production well 4 days after the igniter was turned on. This step had little, if any effect on air-injection rate, thereby indicating that the main resistance to flow was located between Wells 11 and 14. Subsequently, by periodic operation of the igniter in the manner already mentioned, a gradual increase in injection rate was realized; this rate actually became excessively high about 2 weeks before breakthrough occurred and the injection pressure therefore was lowered to 120 psig.

Throughout the 55-day interval between ignition and breakthrough of the combustion front, 2.3 M.M.c.f. of air was injected in Well 14 and 1.5 M.M.c.f. of gas was produced from Well 11, 20-ft. distant. On the basis of a mass balance on nitrogen and the analysis of the combustion gases, it was estimated that about 3,100 lb. (9.5 bbl.) of oil was consumed as fuel during the experiment; this compares with 81 bbl. of oil produced during the same time interval. About 75 million B.t.u. was released in the oil sand by in-situ combustion. An additional 32 million B.t.u. was supplied by the electrical igniter during the same time period.

Following the combustion test, a drilling, coring, and logging program was carried out to determine the extent and location of the burned sand and to obtain estimates of the residual oil and water saturations in the immediate vicinity of the affected area. Information derived from this program showed that only the top 8 ft. of the 20-ft.-thick oil sand was actually burned, but that the burned section extended horizontally as much as 10 ft. on either side of a line between the injection and production wells.

Later, upon withdrawal of the 7-in. slotted liner from the injection well, it was noted that the bottom part of this liner was almost completely plugged with coke and scale. It appears, therefore, that combustion was confined to the top part of the sand because this was the only region which was accessible to air flow.

Presumably, influx of oil into the injection well occurred during equipping of the injection well and before the electrical igniter was turned on, possibly resulting in covering the lower part of the sand face with oil, and in possible cracking of oil around the bottom part of the liner during the early stages of the test; this may have resulted in plugging the lower part of the sand against air entry.

Prospectus

Certain aspects of the process, particularly those involving the maintenance of a continuously advancing combustion front in the presence of rapid increases in downstream liquid saturations, involve technical problems requiring further study. More experimental work is also required to provide engineering data of a type which will permit making an economic appraisal of the process. Nevertheless, it is felt that the technical feasibility of an in-situ combustion method of oil recovery has been conclusively demonstrated and that the results have been sufficiently encouraging to warrant further work along these lines. Accordingly, it is planned to expand the field development program to include one or more additional trials utilizing five-spot well patterns and necessary downhole measurements in appropriately located observation wells.

Such factors as (1) amount of injected air supplied per barrel of oil produced, (2) sweep efficiency of the combustion drive, and (3) pressure gradient in relation to well spacing, all of which can drastically influence the economics of the process, were not subjected to adequate study in the first field experiment. In fact, it is felt that the unusual three-well geometry employed in this test did not favor optimum performance; consequently, additional studies will be undertaken to obtain a realistic picture of the overall operation as conducted in a more conventional well pattern such as a five-spot.

Work on thermal recovery methods by others in this country is hereby acknowledged. Several patents have been issued indicating a growing interest in procedures of this type for increasing recovery of crude oil. One of the most recent of these is assigned to Sinclair Oil & Gas Co.[12] A great deal of work must be carried out before the economics of such processes can be evaluated. Certain phases of this work may require concerted effort by the industry in order to make a commercial evaluation.

References

1. Lindsly, B. E., "Oil Recovery by Use of Heated Gas," The Oil and Gas Journal, 27, No. 31, 27 (December 20, 1928).

2. Stovall, S. L., "Recovery of Oil from Depleted Sands by Means of Dry Steam," Oil Weekly, 74, No. 9, 17 (August 13, 1934).

3. Sheinman, A. B., et al., "Gasification of Crude Oil in Reserovir Sands," Aberbaidzhanskoe Néftyanoe Khozyaistvo, 28, No. 4 (April 1935). Translated by A. A. Boehtlingk; published in Petroleum Engineer, 10, No. 12, 27 (1938); 11, No. 2, 91 (1939).

4. Lapuk, B. B., "Heat Treatment of Oil Sands to Increase Recovery of Oil," Azerbaidzhanskoe Neftyanoe Khozyaistvo, 1939, No. 12, 10-15; translated by A. A. Boehtlingk.

5. Zaks, S. L., "Effect of Temperature on Elimination of Oil from Loose Sands in Gravity Flow," Bull. de l'Acad. Sciences de l'URSS, 1944, 729-733. Translation No. 538, U.O.P. Co. Survey of Foreign Petroleum Literature, September 21, 1945.

6. Frey, F. E., "Method of Recovery of Hydrocarbons," U. S. Patent 2382471 (August 14, 1945) to Phillips Petroleum Co.

7. Barton, P. D., and Dougherty, P. F., "Method of Producing Petroleum," U. S. Patent 2390770 (December 11, 1945) to Sun Oil Co.

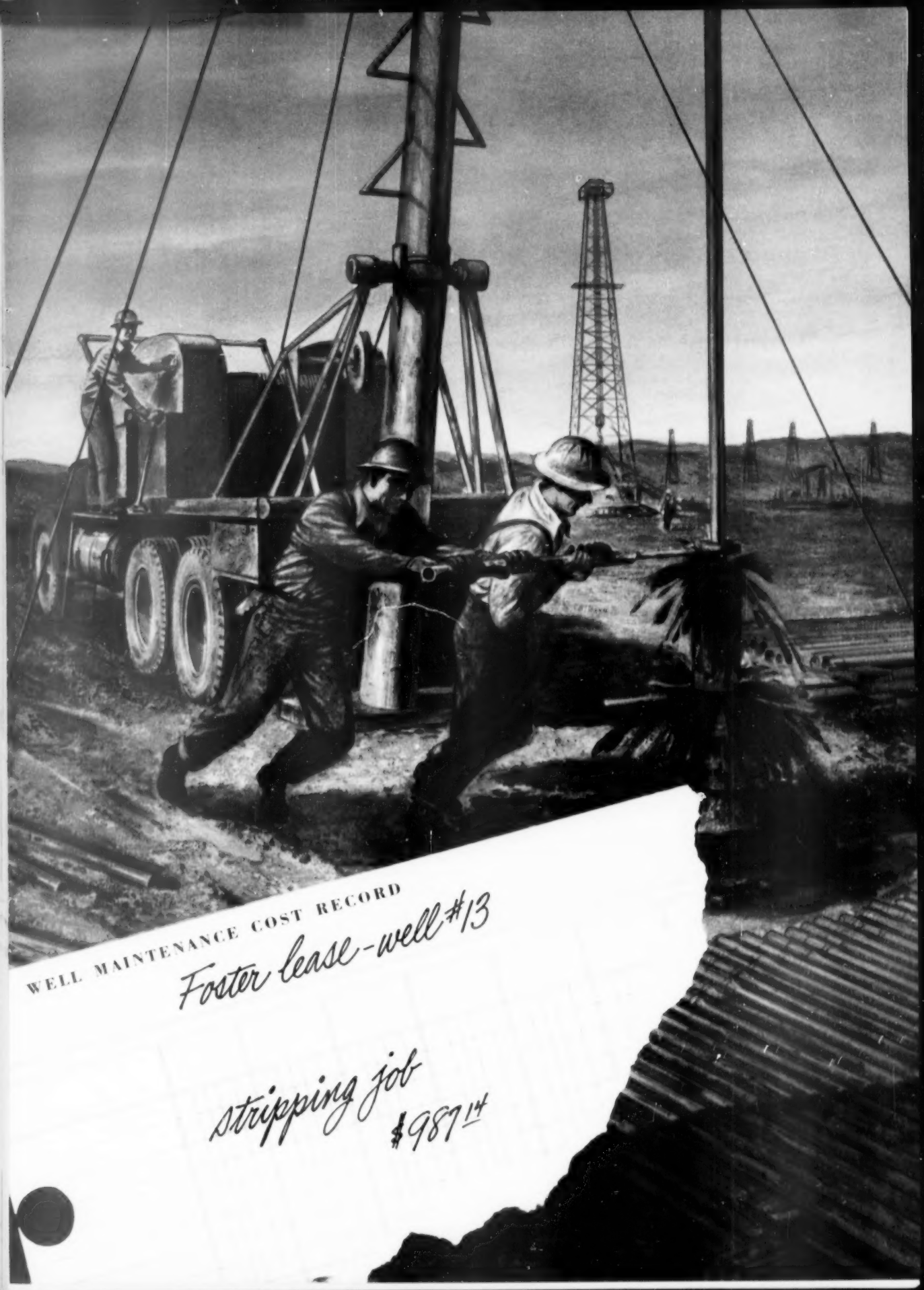
8. Slezak, J. M., and Davis, C. M., "Pyrovolatilization," Producers Monthly, 16, No. 7, 11 (May 1952).

9. Squires, F., and Merriam, E. S., "A Burner for Underground Generation of Heat," Producers Monthly, 16, No. 7, 24 (May 1952).

10. Ingalls, P. C., "Reserves Up Despite Record Withdrawals," The Oil and Gas Journal, 51, No. 38, 204 (January 26, 1953).

11. Greenstein, R. I., and Preston, F. W., "Heat Gain by Unconsolidated Sands During Hot Water Injection," Producers Monthly, 17, No. 4, 16 (February 1953).

12. Smith, R. L., and Watson, K. M., "Oil Recovery Process," U. S. Patent 2642943 (June 23, 1953) to Sinclair Oil & Gas Co.



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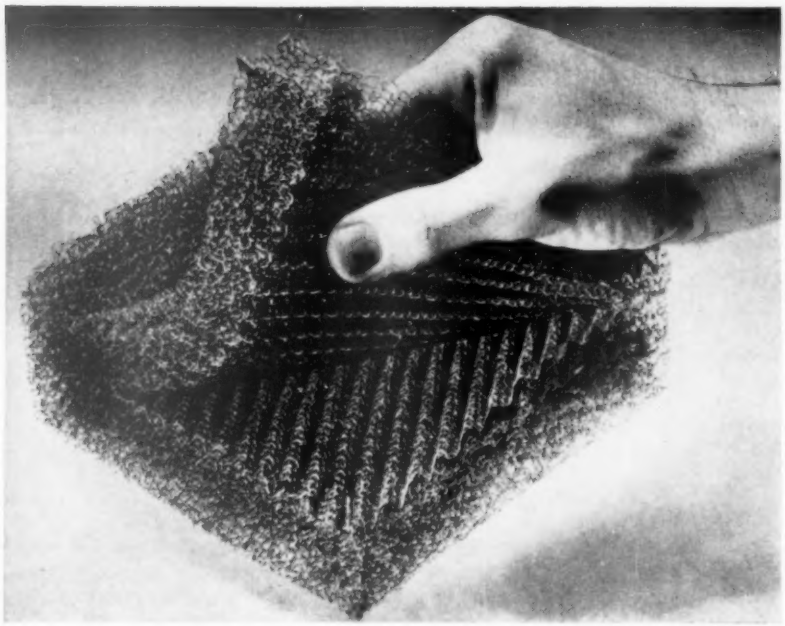


WIRE-MESH ENTRAINMENT SEPARATOR, shown here, bears marked resemblance to air and dust filtration media.

SIMPLE SOLUTION TO PROCESSING PROBLEM

Wire Mesh Removes Liquids From Refinery Vapors

● The knitted wire-mesh entrainment separator will remove 95 per cent or more of the liquid entrained in a gas. Reporting on the reduction of direct losses in refining operations, one refiner reports the use of separators reduced lube losses to one-fifteenth. The units paid for themselves in a few weeks.

● Another refiner uses separators above the flash zone in stills preceding a catalytic unit. Without the separators, the catalyst would be degraded, and on-grade production would be cut by 10 to 15 per cent, he reports.

by Sanford C. Reynolds*

IN any processing operations involving the handling of liquids and gases in intimate contact, ultimate separation of these two phases is never complete, and varying amounts of liquid are always found entrained in the effluent gases. Since this is the result of physical or mechanical reactions between the gas and the liquid, it is logical that industry should look to mechanical means for its control. The word "control" is used advisedly, since the formation of this entrainment cannot be prevented by any means now known.

*Assistant to the executive vice president, Metal Textile Corp., Roselle, N. J. Presented at meeting of Petroleum Division, A.S.M.E., at Los Angeles, July 1953.

What Entrainment Is

Whenever a gas is generated in or passes through a liquid, that gas will carry with it, on disengaging from the liquid surface, varying quantities of small liquid droplets which are caught —entrained—in the rising gas. A similar condition results when a gas is scrubbed or sprayed with a liquid.

This entrainment, or liquid carryover as it is often called, is a true liquid in the form of dispersed droplets some of which may be as small as 1 to 2 μ in size. It must not be confused with a liquid "fog" which consists of particles so small in size that they will float on still air like smoke.

Liquid entrainment, therefore, can be found in practically any vessel in a modern refinery or processing plant, and may often occur in several places, or stages, within a single vessel.

Typical of these vessels are vacuum or atmospheric towers, stills, absorbers, scrubbers, compressors, fractionating towers, reactivators, evaporators, and the like. In fact, entrainment and petroleum refining and processing are inseparably linked from the well head to the finished products.

Effects of Entrainment

In general, the effects of entrainment are evidenced in one of two ways. In some cases the liquid is carried off in the effluent and becomes a direct loss to the operation, or a contaminant to the atmosphere or surroundings. In other cases the liquid is carried on to a subsequent step in the refining process. Here it may contaminate that operation, reduce its effectiveness, cause undue corrosion, or otherwise interfere with processes which are in themselves sufficiently delicate and involved.

In either case, liquid entrainment is an unavoidable concomitant to refining and processing operations, and is a condition that must be taken into account not only in plant operation, but in plant design as well.

Previous preventives . . . A search through several basic text books on refining and chemical engineering has revealed little information on entrainment—and less on the means by which it can be controlled. This might be interpreted to mean that entrainment has become accepted as an inevitable and unavoidable evil. It would probably be more accurate to assume that the calculated efficiencies of the conventional means of removing entrainment have appeared to justify the cost of installing and operating them only in the most serious instances.

In is not the intent of this article to discuss the advantage or shortcomings (if any) of such conventional methods as baffles, centrifuges, louvers, precipitators, knockout drums and the like.

But when the removal of these minute liquid droplets was studied as a problem in filtration, the employment of those physical and mechanical principles which have long since demonstrated their effectiveness in removing minute solid particles from gas and air streams, has resulted in a

simple, practical, highly efficient and economical solution to the problem. In fact, the "filtering out" of liquid droplets is far simpler in one respect: the filtrant, being liquid, can be made to drain itself from the filter by gravity.

The Solution

The result of this approach to the entrainment problem is the knitted wire-mesh entrainment separator, often called a mist eliminator. The illustration shows its similarity to air and dust filtration media.

The separator is a unit, foraminous in structure, made by assembling layers of knitted (not woven) wire mesh into a pad consisting of a multiplicity of unaligned, asymmetrical openings. It removes the entrainment by impingement and accumulation in depth, as opposed to filtering by screens or sieves with minute and regular openings.

Its structure contains sufficient wire surface area—approximately 125 sq. ft. per cubic foot in the standard pad—to remove and collect practically 100 per cent of the entrained droplets under proper velocities and pressures. Its unusually high free volume—approximately 98 per cent—causes minimum restriction to vapor flow and results in a pressure drop generally less than 1 in. of water at atmospheric pressures.

It can be knitted and constructed of practically any metals or alloys (and many plastics) that are available in wire form, thus reducing the problem of corrosion to a minimum. There is no limit to the size in which units can be made.

Mesh units are furnished in two types: (1) Single-piece wound units, generally 4, 6, or 8 in. thick and up to 30 or 36-in. diameter; (2) large sectional units made from laminated strips, generally 4 in. thick and approximately 12¼ in. wide, for easy passage through a manway. Sectional units are factory cut to fit the size and shape of the vessel in which they are to be installed, including cutouts, angles, and flats.

The separator requires no special housings, containers, or connections and are installed within the vessel or tower on supporting bars or gridwork of lightweight open construction similar to subway grating. It contains no moving parts to require attention or power, and there are no valves or gates to be opened and closed.

How it works . . . As the entrainment-laden gas passes through the knitted mesh unit, the liquid droplets impinge on the wires and are removed from the gas. Since the direction of flow is being continually changed as the gas swirls around to seek passage through the maze of wires, impingement of all the droplets is made easier and surer due to the inertia of the heavier liquid particles. As the impinged droplets build up on the wires, they coalesce and form large drops which flow down through the mesh and fall off into the rising vapor flow. The entrainment is literally wiped out and returned: the gas passes on, freed from the objectionable liquid.

How to use it . . . Naturally a knitted wire-mesh entrainment separator must be installed and used correctly for best results, but experience has shown that it will function under a far wider range of operating conditions than will other types of separators. Specific conditions may require special study, but the following four basic principles will give the answer to 99.44 per cent of the entrainment problems.

• For best results units should be installed horizontally, so that the liquid which has been removed from the vapor stream can drain down, and out of, the pad. With vertical installations, the liquid, after being removed by the wires, tends to work through to the free side of the pad as it flows down through the mesh. Units installed at an angle will give better results, but do not approach the efficiency of horizontal mist eliminators when angle is more than 35 degrees.

• Effective entrainment removal is secured at operating velocities which cover an unusually wide range, the upper and lower limits of which can best be defined as follows: (1) On the low side, velocities must be high enough to force the droplets to impinge on the wires, but must not be so low that there is a tendency for some of the smaller particles to drift through the pad. (2) On the high side, velocities must not be so great that the liquid, after being removed, can not flow back against the vapor flow, and will be blown off the top and re-entrained.

Just what these limits are depends upon the operating pressure, the specific gravity, viscosity and surface tension of the liquid, and the density of the carrier gas. Stokes law has been found to be an excellent guide.

Better than 99 per cent entrainment removal will be found, with water and air, at velocities ranging from 2 to 12 ft. per second at atmospheric pressures. Under vacuum the upper limits may be increased to 20 ft. per second or more, while under pressure the upper range should be reduced, since the greater density of the gas will correspondingly obstruct the free fall of the coalesced drops.

In either case, the use of a knitted wire-mesh entrainment separator will assure practically complete entrainment removal over a far wider range of operating velocities. And this in turn means a wider range in column input for any given vessel, and greater operating flexibility.

• While an entrainment separator of this type will remove liquid particles down to about 2 μ in size, greatest efficiencies result when a high percentage of droplets are in the range of 5 μ and up. In other words, when small ones are mixed with larger ones, a larger proportion of the smaller ones will be removed.

It is neither necessary nor advisable to first pass the vapor through a preliminary separator which can only remove the larger particles.

• Since knitted wire-mesh entrainment separators are designed to function at greatest efficiencies with liquids, the possible presence of solid matter in the entrainment should be considered. If the quantity of solid matter is small, it will generally be washed out by the returning liquid. When large quantities of solids are present, or when salts may be deposited on the wires, restriction may increase until the openings become plugged and the unit will cease to function.

Except in the most serious cases, periodic backwashing will serve to remove the restriction.

Results . . . The direct result of using this type of entrainment separator, under the operating conditions previously outlined, will be the removal and return of more than 99 per cent of the liquid entrainment. The ultimate results can only be determined by evaluating either the value of the waste material no longer lost, or the increased efficiency of subsequent operations which no longer must function under the handicap of the undesirable liquid which was produced in some preliminary step in the succession of operations from crude oil to finished products.

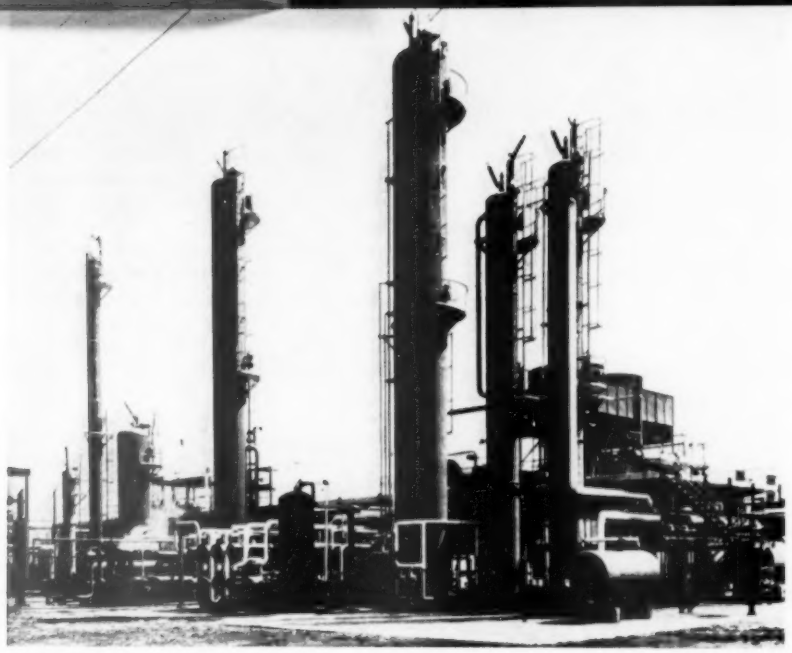
The use of knitted wire-mesh mist eliminators in the top of lube towers has cut lube losses to one-fifteenth, reports one refiner. They more than pay for themselves in a very few weeks.

Another refiner reports that without a wire-mesh separator above the flash zone in stills, he would have to degrade catalyst and cut his on-grade production by 10 to 15 per cent.

From the viewpoint of plant designers, there is one outstanding feature that cannot be lightly dismissed—increased production from a given vessel. Since these vessels can then be operated at far higher velocities than are normally calculated, two desirable results can be expected.

1. Higher throughput can be secured from an existing vessel because it can

(Continued on page 122)



OXIDATION REACTION at Celanese Pampa plant is carried out in these high-pressure stainless-steel reaction units.

PETROCHEM REPORT

High Acetic Acid Yield Obtained By Celanese at Pampa Plant

New catalytic air-oxidation process used to convert butane directly to the acid. Several coproducts are obtained.

by Gerald L. Farrar
Engineering Editor

BUTANE is converted selectively to acetic acid by direct catalytic air oxidation at the Pampa, Tex., petrochemical plant of Celanese Corp. of America. The acetic acid unit has been in operation since November 1952. Design capacity is 1,800,000 lb. per week of glacial acetic acid.

Reaction conditions for the new process are described as "relatively high pressure; relatively low temperature; relatively high residence time"; when compared with reaction conditions which have previously been used for direct catalytic air oxidation of the low-molecular-weight paraffin hydrocarbons.

High yields are obtained from the process which was developed at the company's research laboratories at Clarkwood, Tex., near Corpus Christi.

Other products . . . Facilities are available at the plant to convert varying amounts of the acid into acetic anhydride, as needed. A vinyl acetate plant, with a design basis of 30,000,000 lb. of product per year, is now in operation utilizing a portion of the acid.

Other products produced at the Pampa plant include methanol, acetone, and butyl acetate. The plant has some flexibility in making the higher aliphatic acids and their derivatives; production of these materials is based on demand.

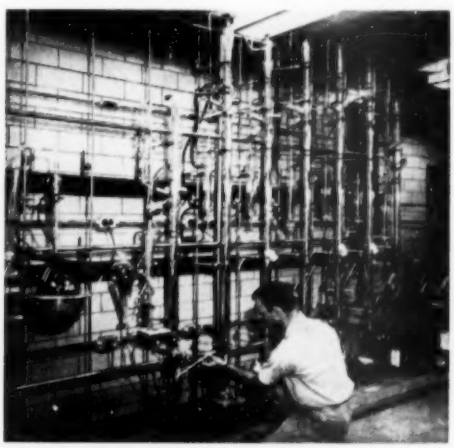
Already in operation, through construction is not yet completed, is a special products unit. This unit is designed to turn out various chemicals, depending on market or raw-material requirements. The unit is currently in butyl acetate production.

Plant Processing

Hydrocarbon feed to the plant is 95 per cent normal butane, 2.5 per cent isobutane, and 2.5 per cent C_4+. While there is some leeway in the type of feed which can be handled, best operation is obtained with a feed stream of such composition, since the unit was designed on this basis.

The butane stream is vaporized, heated to reaction temperature, and compressed to reaction pressure be-

AIR COOLERS and condensers are used for 80 per cent of the cooling load at Pampa. Plant is thought to have world's largest single installation of these units.



PLANT PROCESSING PROBLEMS are worked out in the laboratories adjacent to processing areas.

fore being fed to the reactors. Reaction air is compressed in steam-turbine-driven centrifugal compressors before being joined with the petroleum gases and fed to the reactors. (See flow sheet shown in Fig. 1.)

The centrifugal units are proving very adaptable and efficient in this service. Chief operating difficulty experienced thus far is "surging" in the high-pressure stages when air supply drops substantially below design conditions.

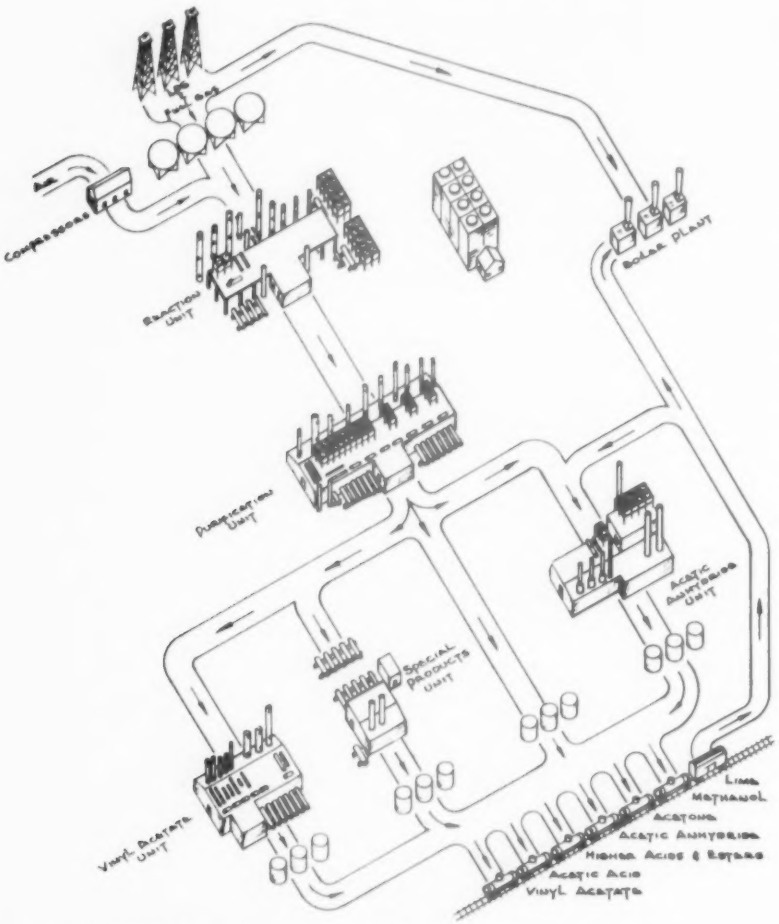
Reaction step . . . The oxidation reaction is carried out at pressures somewhat higher than have commonly been used for direct oxidation of the low-molecular-weight paraffin hydrocarbons, and at somewhat lower temperatures. Contact time or residence time in the reactor is somewhat longer than reaction times which have been employed previously. This is made possible by the specific catalyst for the acetic acid conversion which has been developed by Celanese.

It is significant to note that no formaldehyde is produced in the reaction step; this is a remarkable achievement, in that the major product of a "controlled" oxidation reaction under similar conditions is usually formaldehyde. Another indication of the specificity of the catalyst is that higher aldehydes (mainly acetaldehyde) produced in the primary reaction are ordinarily recycled to the reactor for further oxidation to the corresponding acids.

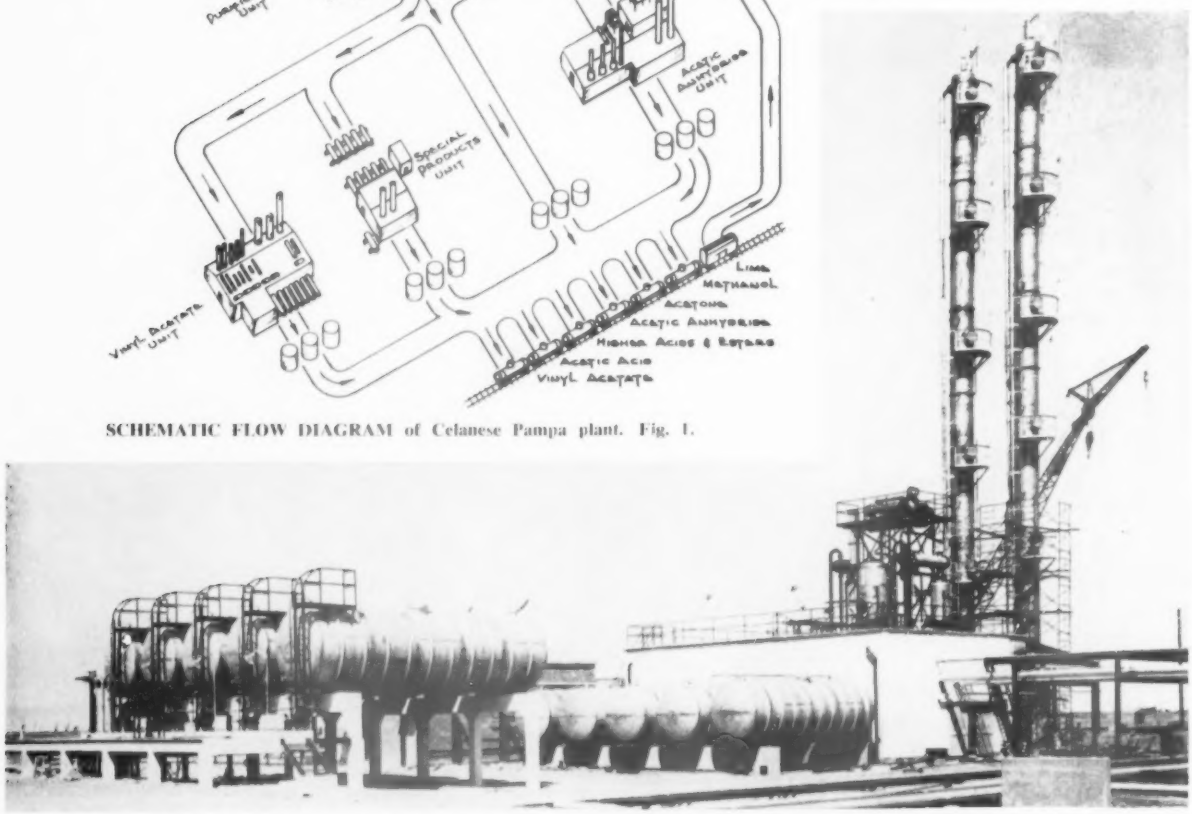
Purification step . . . The product mixture flowing out of the reaction units is passed to the purification unit for separation into pure compounds and selected fractions.

Separation methods used at the Pampa plant embody the latest engineering developments in distillation, extraction, and absorption. Final purification step employed for production of glacial acetic acid involves an azeotropic distillation.

Sieve columns . . . One of the features of equipment design in the separation section of the plant is the adoption of perforated plate, or sieve columns. Application of this type of tray represents the first time it has been accomplished on a plant-wide basis. Engineering work



SCHEMATIC FLOW DIAGRAM of Celanese Pampa plant. Fig. 1.



COPRODUCTS produced in the oxidation reaction are purified and recovered in this **SPECIAL PRODUCTS** unit.

for this application was done at the Bishop plant, the site of Celanese's first large-scale oxidation units.

Keck[1] has described some of the development work on these trays and some of their characteristics:

Bubble-cap difficulties . . . "In the early operation of the Bishop plant considerable difficulty was encountered in the operation of fractionating towers on new compounds. Considerable increases in the capacities of these towers were achieved by rearranging flow patterns and flanking bubble caps.

"However, some of the calculation methods for predicting performance of bubble trays were open to question. For this reason a 6½-ft.-diameter experimental tray, equipped with an 800-g.p.m. pump and a 16,000 s.c.f.m. was installed, and tests were made. The unit was also used to obtain data on the sieve or perforated tray.

"Comparison of results showed that the operation of the sieve tray was very superior to that of the bubble tray. As soon as sufficient information was obtained to justify a plant installation, sieve trays were installed in a 6-ft. diameter, 60-tray tower, which was being added to the purification unit at that time.

Plant-scale tests . . . "The first objective of a plant-scale installation was a study of sieve-tray efficiency. Two alcohols with known relative volatilities were selected for the comparison. An idle 2-ft.-diameter bubble tray column was operated concurrently with the sieve-tray column for the study.

"The study revealed two things. First, that the sieve-tray efficiency was approximately 20 per cent above that of the bubble tray and second that the efficiency of the sieve tray did not vary over the experimental range covered as the operating load in the column changed. Unfortunately the boiling range of the test mixture, n-propanol-secondary butanol, was higher that the design liquid and it was impossible to run the sieve-tray column up to maximum capacity due to limitations in reboiler capacity. Bubble-tray efficiencies are low at low throughputs, rise to a maximum, and then fall off again at high throughputs.

"After these data were obtained, the 60-sieve tray tower was put in service and has operated satisfactorily for about 2 years now.

"Some additional advantages of the sieve-tray column are its simpler construction and consequently lower cost, its easier maintenance, and its higher capacity. Sieve trays should offer about 15 to 20 per cent higher capacity than a bubble tray of the same diameter. The absence of hydraulic gradient on sieve trays is one of the reasons for their greater throughput.

Bubble-cap applications . . . "Certain limitations make it necessary to use bubble trays in some cases. These are high-vacuum and distillation applications, under extreme foaming conditions. In order to get good distribution of the vapors through holes in the trays it is necessary that at least 2 in. of liquid pressure drop be maintained on all sieve trays. For this reason its use is limited in vacuum service.

"The extreme number of small holes in the sieve tray is the contributing factor to its higher efficiency since the objective in a fractionating tower is to get intimate contact of the vapors and liquids. A ⅛-in.-thick carbon-steel plate with ⅛-in.-diameter holes is used.

"About six sieve-tray columns with diameters up to 8 ft. are in operation at Bishop. About three-fourths of the towers at the Edmonton, Alta., plant of Canadian Chemical Co., a Celanese affiliate, will ultimately have sieve trays."

Other Units

Anhydride process . . . Capacity of the acetic anhydride unit is such that all of the plant-produced acid can be converted to the anhydride. Yield of anhydride at the Pampa plant can be predicted from the relationship:

lb. anhydride = 0.8 × lb. acetic acid consumed.

Efficiency of conversion is about 94 per cent, since theoretical yield is about 0.85 lb. for each pound of acid consumed. Theoretical yield is based on the combination of 2 moles of acetic acid to form 1 mole of acetic anhydride, plus 1 mole of water:

$$2CH_3COOH \longrightarrow \begin{matrix} CH_3C{=}O \\ \diagdown \\ \quad O \\ \diagup \\ CH_3C{=}O \end{matrix} + H_2O$$

The reaction proceeds as written. Lime is used as a dehydrating agent to remove the water as it is formed.

Acetic anhydride is a basic organic chemical used in the manufacture of acetate yarns and in many other applications in the textile field.

Special products unit . . . Feed stock for the special products unit is largely derived from a mixture of materials produced as side reactions during the oxidation step.

The unit itself consists of a number of storage and treating tanks, two large fractionating towers, and attendant processing facilities. The towers are so arranged that they may be operated batchwise, or continuously, in series of parallel flow, and under a variety of temperature, pressure, feed, and reflux conditions.

The unit is currently in butyl acetate production. Recovery of propionic acid is a project scheduled for the near future.

Vinyl acetate unit . . . Some of the acetic acid produced at the Pampa plant is used in the production of vinyl acetate. This unit has just recently been put in operation *(see The Oil and Gas Journal, July 13, page 173)*. The acid is reacted with a vinyl compound which is produced at the Bishop plant and shipped to Pampa in tank car.

Vinyl acetate is a highly versatile basic chemical currently used for safety glass, soil conditioners, paints, synthetic fibers, and other industrial products.

Plant Cooling

Considerable cooling capacity is required at the Pampa plant to remove the heat of the exothermic oxidation reactions in addition to that required to handle the usual processing load caused by condensing and cooling to remove sensible heat.

Due to the perennial critical shortage of surface water in the Texas Panhandle, about 80 per cent of the total cooling load of the plant is handled by forced-convection air cooling. As a result, the Pampa plant is thought to be the largest single installation of air-cooled exchangers in the world.

Substantially all streams having an exchanger entrance temperature above 160° F. are first air cooled. Further cooling to temperatures below 160° is taken care of by water-cooled units.

Fans on a number of the air-cooled units are driven by steam turbines. Other fans utilize inert-gas-driven turbines. The inert gas used is nitrogen left after the oxygen in the oxidation air has been exhausted by the reaction. Nitrogen enters the turbine at high pressure required by the oxidation step.

Maintenance problems . . . All of the oxygenated products made at the Pampa plant are highly corrosive, and a number of precautions have been taken to minimize corrosion wherever possible:

- Lines throughout the plant are overhead, to prevent underground corrosion and to enable detection of leaks due to corrosion.
- All portions of the air-cooled exchangers handling acetic acid and other reaction products are fabricated of stainless steel.
- All reaction equipment, plus

PROOF

HERE'S HOW TAPECOAT® HAS STOOD THE TEST OF TIME TO SOLVE CORROSION PROBLEMS

PROOF (Underground) — Inspection of TAPECOATED joints after 10 years of underground service showed no sign of corrosion when the TAPECOAT was removed.

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other equipment in the plant used for subsequent processing of the reaction products, is fabricated of stainless steel.

● Product acetic acid and acetic anhydride are shipped in aluminum tank cars.

Special insulating techniques and comparatively large amounts of insulation were required for the portions of the plant handling acetic acid. The glacial acid product freezes at 60° F., and the comparatively low temperatures and high wind velocities encountered in the Texas Panhandle made special precautions necessary.

Efficient operation . . . The Pampa plant was designed for a high on-stream factor—full-scale operations are planned for 340 days each year. For this reason, the steam plant was designed and instrumented with great care, and all critical services have been placed on steam drive.

About 170 people are employed at the Pampa plant. J. H. Frick is plant manager.

Reference

1. "Canada's New Petrochemical Plant Follows Pattern of Celanese Plant at Bishop, Tex.," by David R. Keck, The Oil and Gas Journal, May 12, 1952.

Wire Mesh Removes Liquids

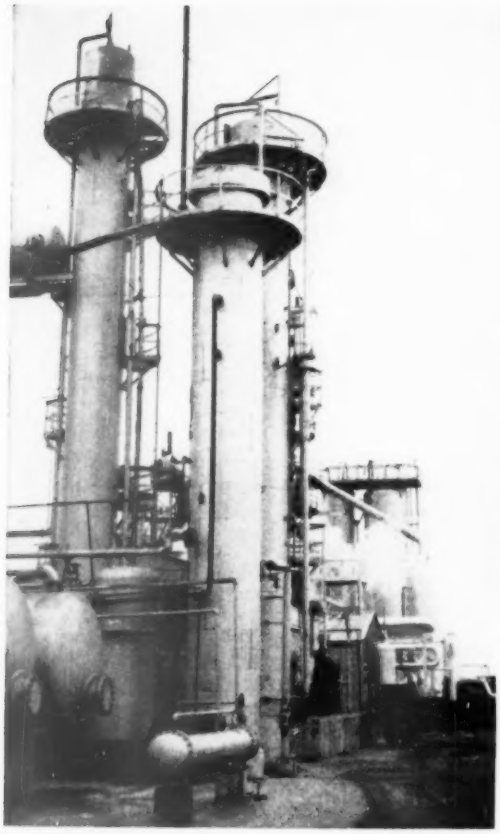
(Continued from page 118)

be operated at higher velocities without the damaging effects of otherwise inevitable entrainment.

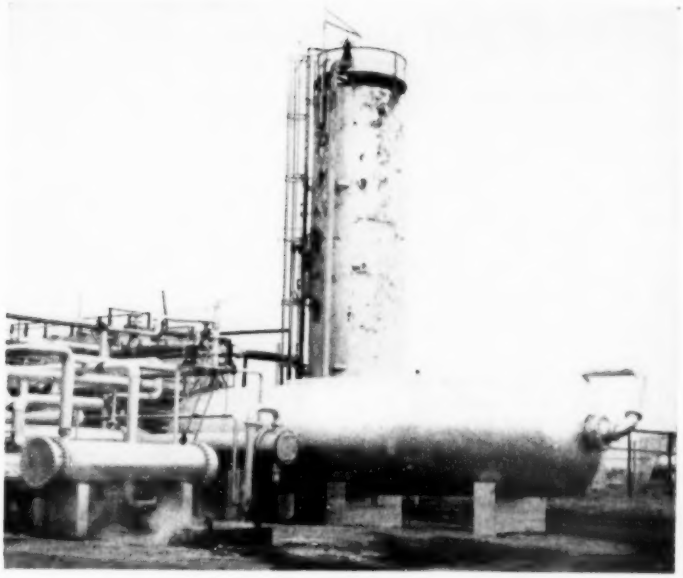
2. New vessels can be made smaller for a given throughput with consequent lower costs. For example: It would require a 6-ft.-diameter knockout drum to handle the entrainment in 2,500,000 cu. ft. per day gas throughput at a velocity of 1 to 2 ft. per second under atmospheric conditions. And at these low velocities, only a small portion of entrained droplets less than 100 μ in size will be removed.

But the same volume through-put can be handled in a 2-ft. 6-in. or 3-ft. drum, operating at 5 to 6 ft. per second velocity with a knitted wire-mesh entrainment separator. Not only will more entrainment be removed, but the cost of the drum will be materially less. This cast differential will be more important yet with pressure vessels.

Unit cost . . . While the price of the unit will depend on the size of the separator and the metal of which it is made, about $9 to $10 per square foot will cover the cost of 75 per cent of the 18-8 stainless-steel entrainment separators now in use. Carbon-steel separators will cost about one-quarter as much.



LIQUID DISCARD from desalting operations is neutralized in column in foreground.



DESALTING OPERATIONS are carried out in these treaters.

REFINING POINTER

Kansas Refinery Completely Desalts Its Charge Stock With Spent Caustic

COMPLETE desalting of its refinery charging stock is being done efficiently and economically by National Cooperative Refinery Association, at McPherson, Kans., by the use of phenol-saturated spent caustic. This is the effluent stream from the fluid catalytic cracked gasoline wash.

Oil refined in this plant is produced in Kansas, and is a combination, or blend, of both light and heavy crude. The amount of light oil processed daily is 23,000 bbl. mixed with 3,000 bbl. of heavy pipe-line oil. The mixture contains an average of 30 lb. of NaCl per 1,000 bbl., and has a b.s. and w. cut of about 0.2 per cent.

The last previous method of removing salt from the refinery charging stock was an application of chemicals which required 16,000 lb. of NaOh per month. While this method of removing the salt from the oil was satisfactory, it entailed a processing cost of about 70 cents per 1,000 bbl., plus the added cost of disposing of the effluent from the desalting equipment.

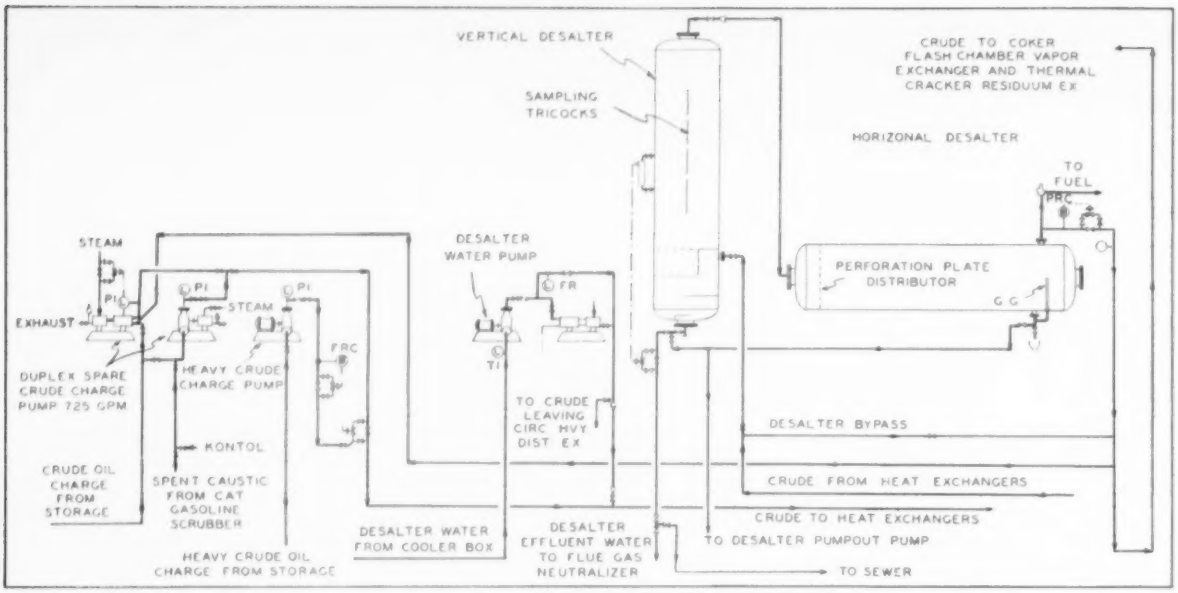
Preliminary tests . . . At the suggestion of John Ward, of the company's refinery division, experiments were carried out in the refinery laboratory using cracker gasoline wash effluent to replace fresh caustic for desalting the crude oil. Results indicated that this waste material could be used.

The effluent from the gasoline wash tanks contains an average of 28 per cent phenols and other acid oils when discarded, approximately the saturation point for the caustic solution when used to wash cracked gasoline. Examination of average samples from crude charge stock, after being contacted with the waste caustic, revealed that the salt was completely removed, and the break was quick and clean. Analysis of the desalted oil did not reveal that the phenols in the wash caused any degradation of the refinery charge, nor that the distillate carried any compounds tending to produce an inferior product.

Plant installation . . . Immediately after the preliminary tests in the laboratory had been completed, preparations were made for the use of spent caustic to replace freshly prepared NaOh solution. Very few changes were necessary to convert the unit to receive spent caustic. The treating plant consists, principally, of two vessels, each the same dimensions, one being installed vertically, and the other horizontally.

Vessels are 10 ft. in diameter and 40 ft. long, equipped with 24-in. manheads at both top and bottom heads. Two side-to-side pans are installed near the bottom, inside the vertical vessel, and a reflector plate is attached to the inner walls covering the crude-inlet nozzle discharge. A level-control kidney valve placed approximately at the 20-ft. point from the base operates an effluent outlet valve to continuously vent the aqueous solution from the bottom manhead through a 2-in. discard line. Trycocks are set into the walls to obtain samples of oil and/or the solution with which the crude is contacted.

The second vessel is installed as close as practicable to the vertical one. The



SCHEMATIC FLOW DIAGRAM of the desalting system.

inlet to this vessel, is in the manhead nearest the vertical treater. Immediately inside the vessel, between 4 and 5 ft. from the end, is a perforated distributor plate to assist with breaking out any aqueous solution that might be carried over from the main treating column.

Operating scheme . . . The method of handling the crude oil as it comes into the plant involves the operation of two pumps, one for the light oil and the other for heavy production, both supplemented by the conventional spares. The light oil comes first, through an 8-in. pipe line from the tank farm. The spent caustic, effluent from the cat cracker gasoline wash, is pumped into this 8-in. line immediately ahead of the centrifugal light-oil pump so that it will be thoroughly mixed with the charge.

The heavy-oil pump picks up the heavier production and discharges it through a 4-in. line which is attached to the light-oil transfer line with a Y-fitting to insure proper blending, and also to provide additional turbulence for the desalting reaction. Spent caustic is fed into the light-oil stream at a rate of 13.6 gal. of the effluent per 1,000 bbl. of crude to be treated. The pH of the effluent as it is withdrawn from gasoline contacting drum is 10.5.

Fresh water from the refinery cooler box is pumped into the blended oil, carrying the discarded caustic solution, at a rate of 6 per cent of the volume of oil, or approximately 50 bbl. of water for each 1,000 bbl. of crude being treated for desalting. All of this volume then flows at pipe-line pressure of about 110 psig. to a series of shell-and-tube interchangers serving the crude-naphtha distillate from the main fractionating column in the topping plant.

After having its temperature raised to a certain extent in these shell-and-tube units, the charge then flows through similar units serving a heavy distillate removed from the 9 by 80-ft. main column at its drawoff pan below the nineteenth bubble plate, and which is returned again to the column on the seventeenth plate, just two plates above the drawoff point. The crude, then having a temperature of 245° F. passes to the vertical vessel in desalting unit.

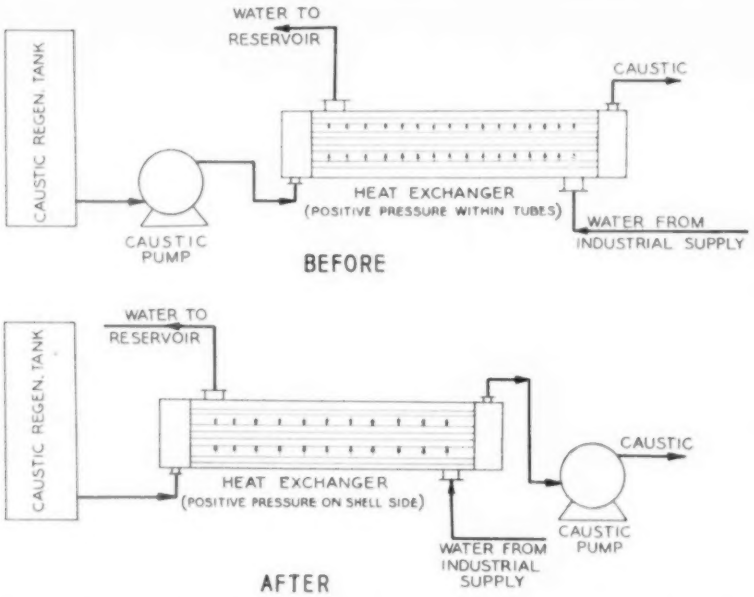
Residence time . . . The residence time in vertical vessel is 30 minutes, which apparently provides adequate time for the separation of the chemicals, salt, and water from the oil being treated. Oil passes outward from the vessel through the top manhead to which is attached an 8-in. line, immediately enlarged to 10 in. Flowing into the horizontal vessel, as it enters through the adjacent manhead to the vertical vessel, the oil is forced at process pressure through the perforated baffle to coalesce suspended water and complete the separation of the aqueous solution from the crude-oil charge. Because this vessel is of the same size as the vertical treater, the residence time is also 30 minutes.

Crude passes from the horizontal vessel, salt free and dehydrated, so that the charge to the following distillation units are protected from erosion and chloride corrosion. A thorough inspection of all subsequent processing units, skimming, fractionation, feed-preparation units and to the catalytic cracker, shows that improved operation is a result of complete removal of the salt. Improvement in the operation and life of the catalyst has been noted, and since this method has been in operation, the catalyst has been notably free from metal poisoning.

Neutralization . . . The saline solution from the vertical vessel, plus the small quantity withdrawn from the horizontal treater, is passed at process pressure —110 psig.—to what is called an effluent neutralizer. This section of the refinery was installed to remove objectionable sulfur compounds with a low boiling point which carry foul odors, such as hydrogen sulfide. The apparatus employed as a neutralizer consists of a vertical vessel with baffle plates over which the effluent flows downward to an outlet at the base.

Flow to the neutralizer is controlled by the level controller on the side of the vertical desalting column. Flow from the neutralizer is controlled by a similar instrument to provide a liquid seal in the base of the neutralizer. Separation of the objectionable volatile compounds from the effluent is obtained by forcing a stream, controlled in volume, of hot stack gases from the catalytic cracking unit into the base of the neutralizer to carry the removed compounds through an outlet in the top head. A tall stack dissipates these vapors into atmosphere and are carried rapidly away by prevailing winds.

Waste liquid from the neutralizer, mingling with other discard, is passed to large surface ponds for precipitation of solids. Frequent analysis of these discards indicate that the disposal system does not contribute to stream pollution when siphoned into surface drainage channels.



How caustic regeneration cooling system was rearranged at Humble Oil & Refining Co. Baytown plant to prevent contamination of plant service water.

Humble Prevents Contamination Of Water by Caustic

POSSIBLE contamination of plant service water due to leaks developing in caustic regeneration cooling system was prevented by relocation of caustic regeneration pump.

In the original layout, caustic from regeneration tank was pumped through the tubes of a heat exchanger and on to treaters, alkylation plant, and intermediate storage. The exchanger was cooled on the shell side by water from an industrial supply system. This water was then piped to plant reservoir No. 1 for further use throughout the plant.

The caustic which was being pumped through the tubes, was at such a pressure that any defects in the tubing would result in caustic leaking into the water system, thereby causing contamination of the entire water supply in reservoir No. 1.

By rearrangement of piping, the caustic pump was removed to the downstream side of the exchanger and caustic was piped directly from the regenerator tank to the heat exchanger. Water passing through the shell under these conditions is at a higher pressure than the caustic and therefore, when any leaks develop, the water will leak into the caustic rather than the reverse condition existing.

Such a leaking condition would be noticed promptly since the caustic is checked for Baumé gravity once each shift and the diluted condition would be observed so that corrective measures could be taken immediately. Under previous conditions, the water carrying traces of caustic would be used in any number of operations before its condition might be discovered by analysis.

Method suggested by Lloyd E. Dreher, helper; courtesy Humble Oil & Refining Co., Baytown, Tex.

Trolley Beam Handles Tube Bundles

AT the Esso Standard Oil Co. Baton Rouge refinery certain tube bundles are cleaned by burning the plugging materials from the outside of the tubes. This procedure involves pouring solvent over the bundle to be cleaned and igniting it. While the bundle is burning, water is circulated through the tubes to keep them cool. That portion of the bundle along the bottom is not exposed to the flames; therefore, to insure thorough cleaning, it is necessary to rotate the bundle three times.

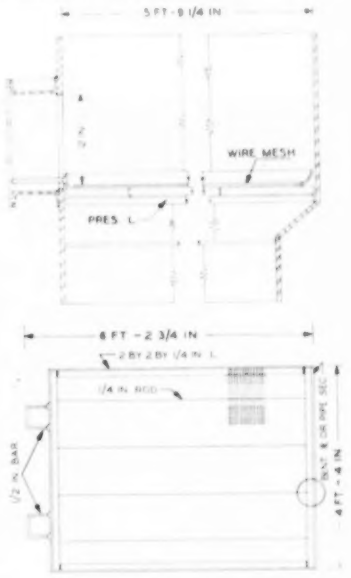
The bundles were formerly rotated with a motorized crane and required about 30 minutes each time a bundle was repositioned. This arrangement consumed a considerable amount of crane time and resulted in high cleaning cost. During the cleaning operation it was also necessary to use an A-frame truck to install the heads on the ends of the bundle which are used for circulating the cooling water.

It was suggested by Hubert Demoulin, first-class machinist, that a trolley beam be installed over the bundle site. This has eliminated the need for using expensive motorized equipment for handling the tube bundles during the burning operation. In addition, it is no longer necessary to hold up operations while waiting on rigger personnel and motorized equipment.

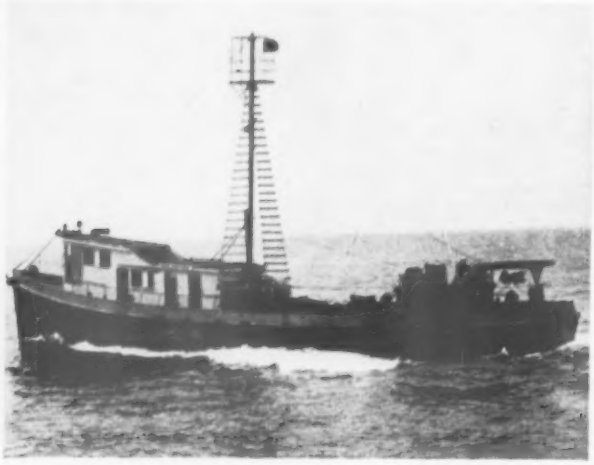
Speeding Up A Maintenance Job

THE original installation of No. 2 Thermofor kiln at the Socony-Vacuum Oil Co., Inc., refinery at Paulsboro, N. J., provided a square manway 18 by 11 in. through which a mechanic must reach to loosen the bolts on grids and screws. This involved a reach of approximately 52 in. with only 8½ in. of head room for clearance. Equipment was fitted through the manway in sections but considerable maneuvering made the job tough.

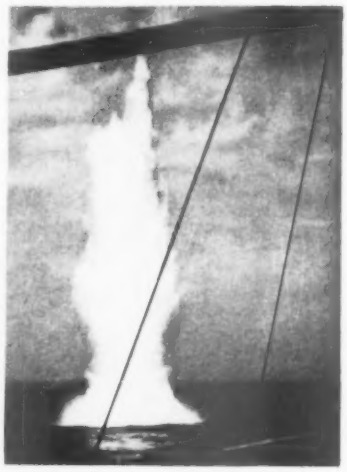
It was proposed by refinery employes that a rectangular slot 12 in. high and 52 in. wide in the east side of the kiln be used to pass the grid and screen in one section. As a further refinement the grid and screen have been welded to the new cover plate.



Recorder in operation.



One of the boats used in the operation.



Explosion during seismic work.

Determining Range in Seismic Marine Exploration

THE precise determination of range in open waters has always been one of the main problems in marine exploration. This is especially true for detailed seismic exploration in which the distance between detectors and charges must be measured with a very high degree of accuracy.

To determine the feasibility of using a Raydist Type R range system for laying out the shot and recording point buoys a trial contract was let by United Geophysical Co. to provide this service for one of its offshore field parties.

The buoys used were of a temporary expandable type consisting of large colored rubber balloons with sash weights as anchors. Different colors were used to indicate whether the station was a shot point, detector station, or instrument setup.

The technique used was for the radio location boat to lay out the instrument setup stations. The boat containing the slave unit of the ranging system was then anchored on the first instrument setup station. The indicating end of the ranging system was then zeroed at the second instrument setup station and the buoy-laying run commenced from there. In making the run the boat was held on the correct azimuth by the radio location system operator.

The buoys were then dropped at the pre-plotted increment ranges as measured along the line by the Raydist ranging system. Shot-point buoys were put in every 1,500 ft. with a detector station buoy 595 ft. ahead of each shot point. The buoys were laid while the boat was under way and it was determined that about 7 miles of buoys could be laid in an hour. What is believed to be production record for this party was obtained the second day of operation with well over 100 profiles being shot. Subsequent analyses of the records showed that a high degree of accuracy was obtained on all records.

Information furnished by V. M. Haywood, Raydist Navigation Corp., Hampton, Va.

Gas-Lift Studies

IN the photo C. H. Hamman and Joe Bagwell, of Cities Service Oil Co., examine a well in the Eunice, N. M., area, which is produced by gas lift on intermittent time cycle. Purpose of the studies is to "time out" various gas-injection cycles and measure the oil and gas production in order to determine flow characteristics involved, which will secure maximum oil production.

PUMP SELECTION—7

What Is Important About Design Conditions?

by Robert L. Jacks*

PUMP-SPECIFICATION items which may be grouped under "design conditions" are considered here.

I. Design conditions . . . 1. Differential pressure: The differential pressure in pounds per square inch is obtained directly by subtracting the suction presure from discharge pressure. This value is then converted to "feet of fluid flowing" by multiplying by the factor of (2.31/sp. gr., at discharge conditions).

2. Liquid horsepower: The liquid horsepower is the output horsepower of the pump and is not to be confused with brake horsepower. Liquid horsepower is computed as

$$\text{Liquid Hp.} = \frac{(\text{g.p.m.})\ (\text{psi.})}{1{,}715}$$

3. Maximum temperature: The design temperature is usually specified as 50° F. higher than the maximum stream temperature. All possibilities should be considered in arriving at a value, such as the use of the pump as spare for a higher-temperature stream.

4. Maximum suction pressure: The maximum suction pressure on the pump is dictated by such factors upstream of the pump as safety-valve settings, hydrostatic head, and maximum discharge pressure of other pumps. Each case must therefore be carefully analyzed before reporting this value.

5. "Shutoff" pressure: While it is rarely necessary to report the shutoff pressure of a pump to the mechanical designer, it is good practice for the process designer to include the approximate value to be expected in his design calculations. For centrifugal pumps, it may be estimated as maximum suction pressure plus 120 per cent of the design pump head differential. For reciprocating pumps, unless the discharge is protected by a safety valve set for a lower value, it is

$$\text{(Max. suct. pressure)} + \left[\frac{\text{(steam cyl. diameter)}}{\text{(fluid cyl. diameter)}}\right]^2 \times \text{(Max. steam } \Delta P\text{)}$$

6. Maximum allowable ΔP across the pump: The casing design pressures of the downstream equipment are generally dictated by the maximum suction pressure on the pump plus a maximum allowable pressure rise through the pump. Pumps specified to the manufacturer only in terms of normal ΔP and maximum suction pressure may result in the design head vs. capacity point being well down on a sharply rising curve. So that downstream equipment can be properly designed or protected for pressure, the maximum allowable pressure rise in the pump (i.e., the limit to which the head vs. capacity curve will rise) should be specified.

J. Special requirements . . . There are a number of considerations of a special nature which should be investigated by the process designer and reported on the specification sheet. Included in this category are the type of pump and the type of driver recommended. When a reciprocating pump is desired, it can be sized by use of the runaround chart shown in Fig. 1, Installment No. 3 of series, July 13. For reciprocating pumps, steam is nearly always the driving medium (some air-driven installations are used), and in this case, the steam suction and exhaust pressure should be supplied.

In the case of centrifugal pumps, the driver is most often an electric motor. When specifying motor drivers, the mechanical designer should be told whether it is necessary to have explosionproof units as this materially affects costs. In all areas where the possibility exists of having explosive mixtures present, explosionproof motors are usually specified.

Turbine drivers for centrifugal pumps are also advantageous in particular cases. Both economic and dependability factors may influence the choice. Thus, for the case where the exhaust steam requirements of an area require throttling of high-pressure steam, it is obviously more economical to do so through a pump turbine than through a control valve. Also, spares for emergency pumps are often steam driven to assure their operation even when a power failure occurs and the same principle applies to process units where the shutdown of a pump due to lack of power would seriously jeopardize the plant.

Other considerations of a special nature include:

1. Particular location desired.

2. Nozzle locations in certain positions only.

3. Zero contamination or zero leakage desired.

4. Type of impeller preferred (open, closed, or partly enclosed).

5. Pump speed (for case where an existing motor is available).

6. Type of seal (conventional seals with packing, mechanical seals, and seal oil injection systems).

*Esso Standard Oil Co., Louisiana Division, Baton Rouge. Excerpt from paper in Chemical Engineering Progress, May 1953, page 235.

5 Reasons Why

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1. Three-Way Service—Adaptable to Flowing, Gas Lifting, and Pumping Conditions.
2. Full Opening for Tools and Packers.
3. Complete Interchangeability of Parts for Easy Conversion to any of the Three Types Shown Below.
4. Forged Steel Construction.
5. Larkin Neoprene Stripper Serves as Blow-out Preventer and Oil Saver while Pulling or Running Tubing.

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Type SR

Type R

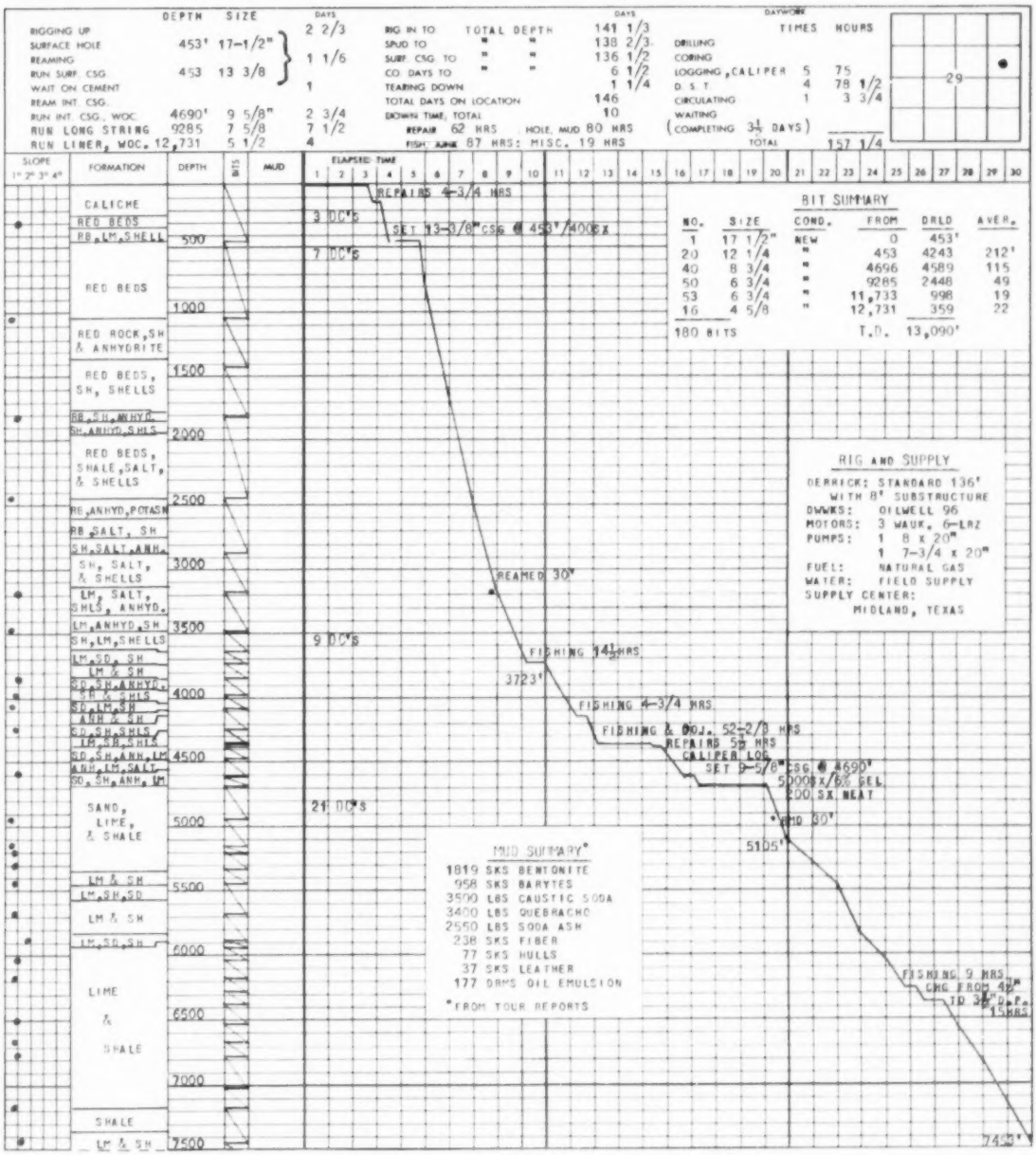
Type M

LARKIN

...Through Your Supply Store

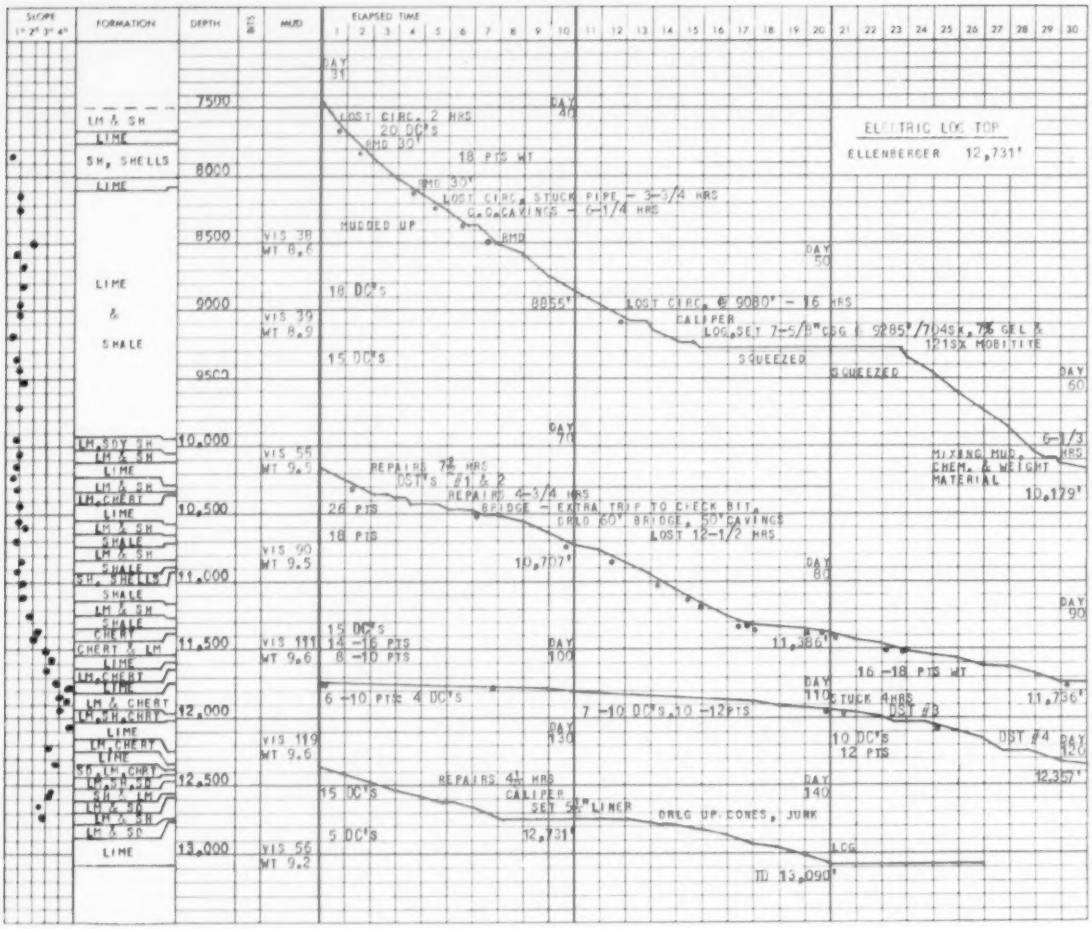
West Texas Ellenburger Drill Log

Contractor: Helmerich & Payne, Inc.
Operator: Magnolia Petroleum Co.
Well: 3 T.X.L. "H."
Location: Section 29, Block 40, T4S, T. & P. Survey, Pegasus field, Midland County, Texas.



(Compiled for The Oil and Gas Journal by Drilling Data Service, Oklahoma City)

West Texas Ellenburger Drill Log (Continued)



Use and Care of Wire Rope—13*

When ordering wire rope a complete description should be given. This should include:

Length: Diameter: Grade: Construction: Flattened strand or round strand.
Number of strands.
Number of wires in each strand.

Lay: Regular right lay will be furnished unless otherwise specified, except in the case of flattened strand rope which most frequently is lang lay. If lang-lay or left-lay round-strand rope is required, it should be specified on the order.

Finish: When a galvanized rope is wanted, it should be so specified—otherwise bright rope will be furnished.

Type of fabrication: When a preformed rope is wanted, it should be so specified, otherwise a nonpreformed rope will be furnished.

Type of core: When a wire-rope core or a wire-strand core is wanted, it should be so stated—otherwise a fiber core will be furnished.

Lubrication: If rope with a protective coating is wanted, specify. Unless special lubrication is required, the type of lubricant should not be specified.

When there is doubt as to what grade, construction or type of rope is best suited for the work to be done, give full particulars as follows:

Use for which intended.
Name, make, and model of machine on which rope will be used.
Approximate speed of rope.
Diameter of drum.
Number and diameter of sheaves.
Reverse bends, if any.
Maximum load to be carried.
Greatest angle of grade in degrees, if for incline.

If practicable, send a rough sketch showing all possible details as to how rope is to operate, location of sheaves, etc.

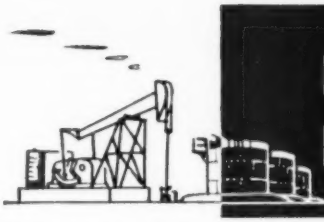
If rope is to be equipped with fittings such as hooks, links, loops, sockets, thimbles, etc.; state exact length between bearing points if fittings are on both ends; or from bearing point to end of rope if fitting is attached to only one end.

If an endless rope or sling is wanted be sure to state definitely whether the length specified is when measured around the circumference or when pulled together double.

When ordering an endless transmission rope, give distance from center to center of sheaves, and the diameter of both measured between bottom of grooves.

* Taken from Bulletin 61, Use and Care of Wire Rope, A. Leschen & Sons Rope Co.

by R. I. Martin*



ENGINEERING FUNDAMENTALS

ELECTRIC LOGGING—7

Conventional Resistivity Logging

FOR convenience, the measurement of resistivities with one, two, and three-electrode devices, and the measurement of spontaneous potentials with a single electrode will be called conventional logging methods. These were the earlier methods used in all cases, and are still used for logging soft and intermediate formations.

All logging measurements Ra are affected to a greater or less extent by the following factors:

1. True resistivity of the bed in question—Rt.
2. True resistivity of the surrounding beds—Rs.
3. Resistivity of the drilling mud opposite the bed—Rm.
4. Resistivity of the invaded zone —Ri.
5. Diameter of the bore hole—d.
6. Extent of invasion of the drilling mud—Di.
7. Bed thickness—e.
8. Electrode type, and spacing used.

The disturbing effect of these factors should be kept in mind. As a matter of convenience, however, some of them will be neglected when discussing the underlying theory. Finally it will be shown how they may all be taken into account under favorable conditions in the field.

Fig. 1 shows schematically the three-dimensional flow of current when a single electrode is placed in a homogeneous isotropic medium with one boundary plane, such as the surface of the ground. This medium might be all shale, that is, homogeneous, but it is necessary to specify further that it is isotropic. This means that it has equal properties in all directions.

The current leaving electrode A and returning to electrode B is not confined to a spindle-shaped path between them, but spreads throughout the conducting medium. There is no part, however remote, which does not receive some part of the current. In the immediate vicinity of electrode A, the current flow is radial with equal intensity in all directions. The broken lines divide the volume into five zones containing equal portions of the total current flow. If a measuring device with a depth of investigation r is placed at point H then 20 per cent of the current will flow within this range while 80 per cent will pass outside. If the same measuring device is placed at a point P, more than 20 per cent of the current will flow within its radius of investigation. In this second case the measuring device will be affected less by the formation at a distance.

This becomes important when the medium is not homogeneous and isotropic. In this case the pattern will become distorted, but the preceding discussion is still valid qualitatively. The percentage of current which is related to far distant material will be greater at points far from the current electrode A, than at points situated closer to it. This is commonly expressed by saying that the penetration is greater for long electrode spacings than for shorter ones.

Fig. 2 shows an enlarged view of the current flow from electrode A. The flow is radial and several possibilities exist for measuring the resistivity of the formation.

The difference of potential dV between points located on an equipotential sphere of radius r and potential V, and on an equipotential sphere of radius r + dr and potential V + dV may be expressed by

$$dV = \frac{RI}{4\pi r^2}\,dr$$

when R is the resistivity of the medium.

Expressed in words: The potential difference between the spheres is equal to the current between spheres times the resistance between spheres.

The resistance is that of a path length dr, of cross-section $4\pi r^2$, and of resistivity R.

Taking the potential as zero at great distances from A and integrating between the limits r = r and r = infinity, the potential V at a distance r from source A, is obtained.

$$V = \frac{RI}{4\pi r}$$

If the current I is held constant then V varies directly with R the resistivity, and is therefore a measure of the resistivity of the formation. This method is used for both the mono-electrode and the two electrode logging devices.

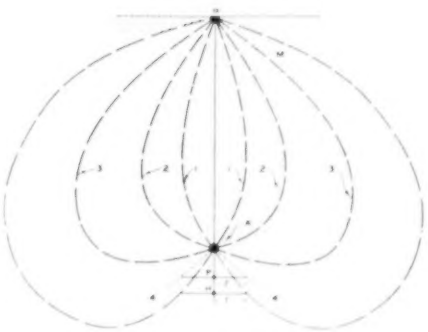


Fig. 1—Three dimensional current flow.

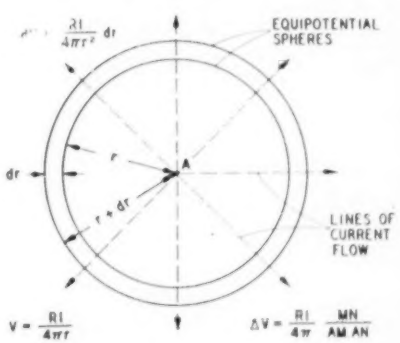


Fig. 2—View of current flow from electrode.

*Assistant professor of petroleum engineering, Missouri School of Mines and Metallurgy.

Part 40 of a series

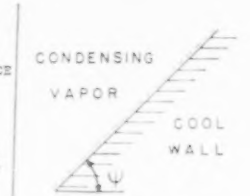
by Dr. B. E. Lauer, Head, Department of Chemical Engineering, University of Colorado

h_f HEAT TRANSFER

COEFFICIENT of HEAT TRANSFER through FILM between SURFACE of COOL INCLINED SURFACE and CONDENSING VAPOR

Vapor Movement: Natural Convection

Condensate Movement: Isothermal Streamline Flow Down Wall



EQUATION:

$$h_f = 0.943 \left[\frac{k^3 \rho^2 \lambda (\sin\Psi) g}{L \mu \Delta t}\right]^{\frac{1}{4}}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr. sq. ft. ^{o}F.

k - Thermal conductivity of condensate at condensate temperature, t_f, BTU/hr. sq. ft. ^{o}F./ft.

ρ - Density of condensate at condensate temperature, t_f, ^{o}F.

g - Acceleration of gravity. 4.17×10^8 ft./hr.^{2}

λ - Latent heat of condensation of vapor at saturation temperature, BTU/lb.

μ - Viscosity of the condensate at condensate temperature t_f, lb./ft. hr.

L - Height of vertical wall, ft.

Δt - Temperature difference between wall and gas, ^{o}F.

Ψ - Angle inclined plane makes with horizontal.

t_f - Condensate temperature assumed as equal to dewpoint temperature of vapor minus 3/4 (Δt), ^{o}F.

LIMITATIONS:

Equation is not applicable to dropwise or mixed condensation.

SOURCE OF DATA:

For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ -- see pp. 130-148, 175-195, 1683.
μ -- see pp. 370-374, 1198, 1696.
k -- see pp. 459-461, 1303, 1697.
λ -- see pp. 215-217, 299, 249-280, 568.

REFERENCES:

1. H. F. Benenati and D. H. Ulmer, "Film Coefficients for the Condensation of Vapors", Chem. and Met. Engr., 51, pp. 107-8 (May 1944).

2. Heat Transmission, William H. Mcadams, pp. 254-294.

3. Applied Heat Transmission, Herman J. Hoover, pp. 108 ff. (Graphs are given for 25 liquids for various rates of condensation and at various film temperature for surfaces from 2 to 20 feet.

4. Introduction to Heat Transfer, Brown and Marco, p. 130.

N 3

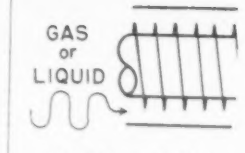
COEFFICIENT of HEAT TRANSFER through FILM between OUTSIDE of a FINNED TUBE and a FLUID

Tube Position: Horizontal or Vertical

Fluid Movement: Turbulent Flow

Direction of Movement: Parallel to tube

Direction of Heat Flow: Cooling or Heating



EQUATION:

$$h_f = 0.023 \frac{k}{D'} \left[\frac{D_e V \rho}{\mu}\right]^{0.8} \left[\frac{C_p \mu}{k}\right]^{0.4}$$

TERMINOLOGY:

h_f - Film coefficient of heat transfer, BTU/hr.sq.ft.^{o}F.
k - Thermal conductivity of fluid, BTU/hr. sq. ft. ^{o}F./ft. evaluated at t_f.
D_e - Equivalent diameter, ft. $D_e = 4s/b$.
s - Cross section open to flow in sq. ft.
b - wetted perimeter in ft.
D' - Inside diameter of outside wall of annulus minus D_E of inner tube.
D_E - Equivalent diameter or diameter of a plain tube which has some longitudinal cross section as the finned tube (including fins).
V - Linear velocity of flow, ft./hr.
ρ - Density of fluid, lb./cu. ft.
μ - Absolute viscosity at t_f, lb./hr. ft.
C_p - Specific heat of fluid at constant pressure at t_f, BTU/lb. ^{o}F.
t_f - Film temperature, assumed as arithmetic average of tube temperature and bulk liquid temperature, ^{o}F.

LIMITATIONS:

This equation is limited to fluids having viscosities not more than twice that of water and for Reynolds numbers exceeding 2100.

PHYSICAL CONSTANTS: The values of the physical constants such as density, viscosity and others are reported in the International Critical Tables, in several handbooks, and in the technical literature.

Page references in the Chemical Engineers' Handbook, J. H. Perry (1948) are as follows:

for ρ -- 130-148, 175-195, 1683.
μ -- 370-374, 1198, 1696.
K -- 459-461, 1303, 1697.
C -- 228-235, 297, 1688, 1696.

REFERENCES:

1. D. L. Katz, K. C. Beatty, and A. S. Foust, Trans. Am. Soc. Mech. Engrs., 67, 670 (1945).

2. E. P. Briedenbach and H. P. O'Connell, Trans. Am. Inst. Chem. Engrs., 40, 764 (1946).

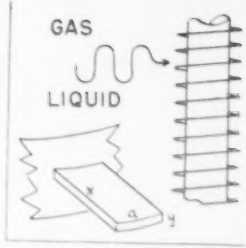
C 1,5,4,5 e (1)

COEFFICIENT of HEAT TRANSFER through FILM between OUTSIDE SURFACE of a FINNED TUBE and a GAS or a LIQUID

Fluid Movement: Turbulent

Direction of Movement: Normal to tube

Direction of heat flow: Cooling or Heating



EQUATION:

$$h_f = 1.0\, C_p G_{max} \left[\frac{Z_p G_{max}}{\mu_f}\right]^{-\frac{1}{2}} \left[\frac{C_p \mu_f}{k}\right]^{-\frac{2}{3}}$$

TERMINOLOGY:

h_f - Film coefficient of heat trans. BTU/hr.sq.ft.^{o}F.
C_p - Specific heat of liquid at const. press. BTU/lb.^{o}F.
G_{max} - Mass vel. through min. free area, lbs./sq.ft.hr.
μ - Absolute viscosity at bulk temperature lb./hr.ft.
μ_f - Viscosity at average film temperature.
K - Thermal conductivity of fluid BTU/hr.sq.ft.^{o}F./ft.
Z_p - Twice the perimeter over which the fluid flows in passing fin, ft.

For banks of spiral finned tubes, one or two rows deep.

for crimped spiral fins

$$Z_p = 2\left[\frac{\pi (D_o + 2x_f)(N)(2x_f) + (\pi D_o)}{2N}\right]^{\frac{1}{2}}$$

for non-crimped fins

$$Z_p = 2\left[\frac{[\pi/4][(D_o+2x_f)^2 - D_o^2][2N] + \pi D_o + \pi y (2x_f)(N)}{2N}\right]^{\frac{1}{2}}$$

For short fins consisting of strips or pins

$$Z_p = 2(a + y)$$

N - Number of turns per foot.
D_o - Outside diameter of cylinder at base of fin, ft.
x_f - Total length of bar fin, ft.
y - Thickness of fin, ft.
a - Width of fin, ft.

LIMITATIONS: Equation developed for heating air over finned tube. Probably applicable to other situations.

Factor ($C_p G_{max} \mu_f$) should be between 2,700 and 10,000.

SIMPLIFIED EQUATION: for air

$$h_f = \frac{1}{0.8}\, G \left(\frac{C_p G}{\mu_f}\right)^{-0.6}$$

PHYSICAL CONSTANTS: For physical constants for use in above equation see Chemical Engineers' Handbook - J. H. Perry (1948).

for ρ - 130-148, 175-195, 1683.
μ - 370-374, 1198, 1696.
K - 459-461, 1303, 1697.
C - 228-235, 297, 1688, 1696.

REFERENCES:

1. H. H. Morris and W. A. Spofford, Trans. Am. Soc. Heat. Engrs. 44, 409 (1942).

2. Heat Transmission, William H. Mcadams, pp. 254-280.

C 1,5,4,5 e (2)

Controlling Corrosion*

THE coal-tar and asphalt coatings are by far the most popular of the coating materials used to prevent corrosion. Asphalt coatings are less susceptible to impact and temperature changes, but they may be affected by the absorption of small quantities of soil moisture or they may be dissolved by oil products contained in the soil. Coal-tar-base coatings are probably the most widely used pipe-line coating materials.

Application . . . One of the most important steps for the application of either of these coatings is the proper preparation of the pipe to be coated. The pipe must be clean, free of dirt, moisture, rust, mill scale and the like, and must be primed by painting with some material which will bond to the pipe and to the material with which it is proposed to protect the pipe.

In most cases, with hot coatings at least, it is customary to wrap over the enamel or coating while it is still hot and viscous with a felt, asbestos, or glass-fiber wrapper. The purpose of the wrapper is to prevent injury to the coating during backfill and deformation of the coating due to soil stresses produced as the backfill settles. Fig. 18 shows a typical over-the-ditch mechanical coating and wrapping application utilizing a primer, a hot coal-tar enamel, and a protective wrapper.

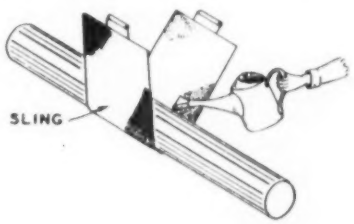
Sometimes combinations of wrappers are used. An excellent combination consists of a fiber-glass wrapper imbedded in the enamel supplemented by an asbestos felt wrapper bonded to the surface of the enamel. The glass wrapper reinforces the coating and the asbestos felt wrapper protects it from soil stress.

Sometimes these coatings are applied by hand and sometimes by the use of the machinery. Small coating jobs including the patching of large machine-applied jobs are usually accomplished by hand (Fig. 19) using a canvas sling and pouring bucket to apply the coating material. Coating jobs which are not large enough to warrant the use of over-the-ditch machinery may be completed by using a rolling rig (Fig. 20), either along the right-of-way or in the pipe yard or rail terminal.

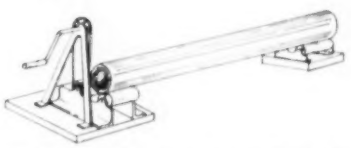
Inspectors usually watch the application of the coating and wrapper to see that they are applied according to the specifications. In addition to this visual inspection of the application of the coating, most applied coatings are checked to determine whether or not there are any small faults or pinholes commonly called "holidays" in the coating. This is usually accomplished by using one of several different kinds of electrical testing devices or "holiday" detectors (Fig. 21).

All of these tests are done before the pipe is lowered in the ditch. During the course of lowering and backfilling, additional holidays may be formed. These can be detected by means of a special electrical device even though the pipe is buried. If this special instrument indicates any large areas where the coating has been damaged, it may be necessary to uncover the line to repair the damaged place.

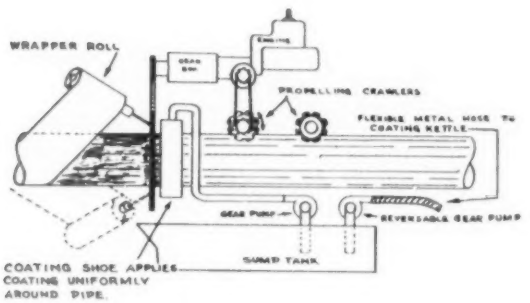
*Taken from A Manual on Underground Corrosion, Columbia Gas System Service Corp. Figure numbers used in the series are progressive.



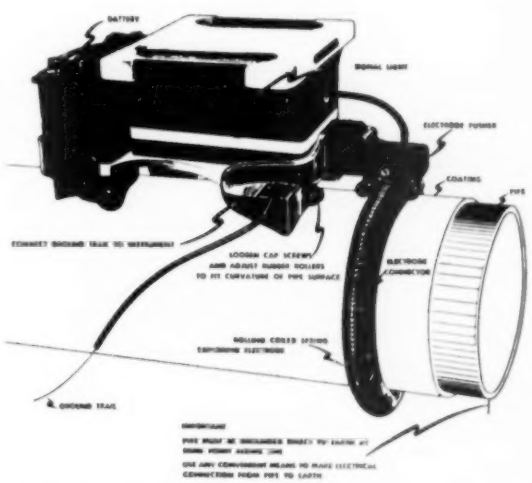
HAND APPLICATION of pipe-line coating. Fig. 19.



ROLLING RIG for small coating jobs. Fig. 20.



MECHANICAL-COATING machine for pipe-line application. Fig. 18.



HOLIDAY DETECTOR for locating small faults or pinholes in coating. Fig. 21.

This small FILTER makes TOUGH JOBS

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EQUIPMENT MEN . . . in the News

Maloney-Crawford Opens Two New Branch Offices

New branch offices have been opened at Hobbs, N. M., and Healdton, Okla., by Maloney-Crawford Tank & Manufacturing Co., according to S. P. Wallace, president. Both locations will offer stock and field service.

Hobbs personnel includes H. H. Guthrie, branch manager; Bill Brock, field man, and T. E. Goodwin, in charge of the warehouse. L. W. Moseley is branch manager at Healdton, and G. W. Martin is in charge of the warehouse. Q. B. Johnson is field man.

Bosley Named Petroleum Industry Specialist

In a move better to serve the petroleum industry, Owens-Corning Fiberglas Corp. has appointed Samuel E. Bosley, for 5 years the company's Tulsa branch manager, as petroleum-industry specialist. Bosley's headquarters will remain in Tulsa, but he will be available to designers and manufacturers of equipment used in the petroleum industry, as well as to contractors and operators of production, pipe-line, refinery, and marketing facilities in Northern Texas, Louisiana, and Oklahoma. Bosley has been with Owens-Corning since 1946, and he will serve the petroleum industry in applying his broad knowledge of the application of Fiberglas products to problems of corrosion, filtration, heat control, and other processes.

Dowell Appoints Wagner Assistant District Manager

Ray R. Wagner has been appointed assistant district manager for Dowell Incorporated at Oklahoma City, according to an announcement by L. A. Courter, district manager. Wagner will be responsible for all maintenance, safety, employe relations, and purchasing.

Wagner joined Dowell at Seagraves, Tex., in 1940 as an equipment operator. He was subsequently a junior service engineer and service engineer in West Texas. In 1944 he was transferred to the company's general office in Tulsa as a mechanical engineer, later becoming maintenance engineer, maintenance supervisor, and development engineer. In December 1950 he was transferred to Midland, Tex., as assistant district manager, a position he held until his recent transfer to Oklahoma City.

Ash Named Macco General Construction Superintendent

The appointment of L. E. Ash to the position of general construction superintendent of the refinery division has been announced by the Macco Corp. of Paramount, Calif.

Ash comes to Macco with wide experience in the oil and chemical construction fields. For the past 6 years he has been construction superintendent, engineer and project manager for Foster Wheeler Corp., and also acted as the company's engineering representative in England and Norway and conducted economic surveys of various types in England and Belgium. Other experiences include the design and construction of paper mills, superintending construction of oil refineries and engineering of structural design, piping, and estimating.

Oakite Assigns Cunningham To Beaumont, Tex., Territory

L. M. (Larry) Cunningham, for the past 6 years technical representative in the Shreveport area of Oakite Products, Inc., manufacturers of specialized cleaning and allied materials, has been appointed to the company's new Beaumont field territory embracing southeastern Texas and central and southwestern Louisiana.

A member of the company's field organization since 1947, Cunningham comes to his new position after extensive experience in petroleum-industry cleaning and related operations.

Ferguson Is Appointed District Sales Manager

L. E. FERGUSON

Laurence E. Ferguson has been appointed district sales manager for the Oklahoma-Kansas territory for Industrial Supply Co. of Texas, Wichita Falls, Tex., with offices in Tulsa.

Ferguson has specialized in oil-field machinery, equipment, and general supplies in the Mid-Continent area during the past 20 years. He formerly was sales manager of Franks Manufacturing Corp., oil-field sales manager of Wheland Co., and most recently was with Iverson Supply Co.

Industrial Supply operates eight stores in the Southwest, and maintains five district offices.

Tex-Tube, Inc., Adds Kearney To Sales Force

Raymond W. Kearney, Jr., has recently been added to the sales force of Tex-Tube, Inc. He will represent Tex-Tube in West and Southwest areas of Texas.

Kearney's experience includes 10 years of oil-field sales and service work in equipment, corrosion control, and oil treating. He attended University of Texas and Southern Methodist University.

Oilwell Names Rowe, Love To New Posts

Two appointments in the Gulf Coast area has been announced by Melvin F. Jones, area manager for U. S. Steel's Oil Well Supply Division.

Harry A. Rowe has been made Oilwell store manager at Beaumont, Tex., and James T. Love has been appointed district engineer, refinery and pipeline sales for the Beaumont, Orange, and Port Arthur, Tex., area.

Prior to his present appointment Rowe was assistant to the district merchandise manager at Oilwell's Houston warehouse. He began work for Oilwell in June 1943, and served at several Texas and Louisiana stores before going to Houston.

Love managed the Beaumont Oilwell store before being named to his present post. He started work for Oilwell in March 1946, and was appointed head of the Beaumont store in 1950.

Wheeley Made District Sales Manager by Koppers

B. O. WHEELEY

Promotion of B. Otto Wheeley to the position of southern district sales manager for the tar-products division of Koppers Co., Inc., was announced recently by J. C. Macon, Jr., division sales manager. Wheeley, who has been assistant district manager, with headquarters in Birmingham, Ala., succeeds F. G. Owen, recently deceased.

Wheeley joined Koppers in 1943 as a cadet engineer. In the following 10 years he was promoted consistently to administrative assistant, assistant to district manager, and assistant district sales manager.

In his new position Wheeley will have charge of sales of all the division's products in 10 southern states.

National Supply Opens New Store at Fort Morgan, Colo.

The National Supply Co. has announced the opening of a new store at Fort Morgan, Colo. This latest oil-field supply outlet will enable the company better to serve operators in the southern and western portions of the Denver-Julesburg Basin.

The Fort Morgan store comes under the supervision of C. L. Bainter, National Supply's district manager, Denver.

The store, in this rapidly expanding area, is under the direction of B. R. Hibdon, store manager. Field salesmen are J. L. Grant and R. L. Arnold.

Pfaudler Named Licensee For Shell Turbogrid Trays

The Pfaudler Co. has been appointed fabricating licensee for turbogrid trays used in fractionating towers under an agreement with Shell Development Co. of Emeryville, Calif.

The result of 20 years' research by Shell on distillation problems and equipment, turbogrid trays are a new type of vapor-liquid contacting tray for distillation columns. They are used in columns for aromatics recovery units,

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PROTECTS TUBING FROM PUMPING HAZARDS*

*The Original Overhead Packed Tubing Hanger

SOLD THROUGH ALL SUPPLY STORES

Don't put your well "on pump" without installing a HERCULES Tubing Hanger for suspending the tubing. The HERCULES Tubing Hanger was especially designed for TUBING PROTECTION and helps eliminate hazards on pumping wells. Remember—a HERCULES Tubing Hanger is your best insurance against tubing dropping from accidents at top of well. Be sure to specify HERCULES when ordering pumping well equipment. For additional information, write for Bulletin 101-H.

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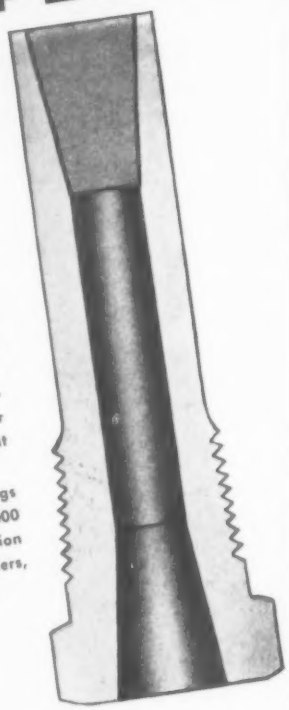

• Weco Fusible Plugs meet revised A.S.M.E. requirements and are made in strict accordance with the requirements of the Power Boiler Code Committee. They are acceptable to all Boiler Inspection Authorities working under A.S.M.E. codes.

The ¾"x4" Fusible Plug provides additional protection. It will melt out at approximately 450 deg. F. When it melts-out it leaves approximately 9/16" of water over the crown sheet to prevent damage.

All Weco Fusible Plugs are kerosene tested to 1000 lbs. pressure. For protection and safety of your boilers, use Weco Fusible Plugs.

WECO FUSIBLE PLUGS

SIZE	NO.	WEIGHT
½" x 2¼"	1093	5 oz.
½" x 2¾"	1087	6 oz.
½" x 3½"	1081	8 oz.
¾" x 2¼"	1091	8 oz.
¾" x 3"	1085	10 oz.
¾" x 3" Lg. Thd.*	1097	10 oz.
¾" x 4"	1079	12 oz.
¾" x 4" Lg. Thd.*	1095	12 oz.
1" x 2-5/16"	1089	12 oz.
1" x 3"	1083	13 oz.
1" x 4'	1077	16 oz.

*1¾" Thread length

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WELL EQUIPMENT MFG. CORP.

Division of Chiksan Company

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CHIKSAN COMPANY

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Manufacturers and Distributors of Oilfield, Refining, Marine and Industrial Equipment

catalytic cracking gas-recovery units, ammonia plants, crude-oil units, and natural-gas plants.

As a result of the agreement with Shell, Pfaudler Co. now will be able to service customers with all three major types of trays used in distillation columns.

Beaumont Iron Names Sloan West Texas Representative

O. C. SLOAN

O. C. Sloan has been named West Texas representative for Beaumont Iron Works Co., as announced by T. L. (Doc) Fontaine, manager of oilfield-equipment sales. Sloan's headquarters will be in Odessa. Sloan formerly served in the gas-lift and production-equipment department of Wilson Supply Co., Monahans, Tex., for 5 years and handled production and drilling equipment for Texas Iron Works in Odessa for a year and a half.

Floyd Named to New Sales Post by Reilly Tar & Chemical

M. F. FLOYD

Reilly Tar & Chemical Corp. has announced the appointment of Moore F. Floyd as sales representative in Texas, replacing Charles L. Slover, who will become associated with Keith-Kote Co. of Grand Prairie, Tex.

Floyd has had previous experience in oil-well drilling operations, and was connected with Magnolia Petroleum Co. at Midland, Tex. He will be stationed at Dallas.

Ohio Injector Announces New Staff Promotions

Ohio Injector Co. of Wadsworth, Ohio, has announced two new staff promotions to implement the increased work of sales managers and salesmen in the field resulting from the company's recent growth and expansion.

Harry C. Bell will become manager, engineering sales, representing sales managers in decisions on new product design. He will serve as liaison with the engineering department on development data as required by Ohio Injector customers.

Paul E. Warner has been named manager, sales promotion. Formerly sales manager of the company's Atlantic division, Warner will be in charge of all advertising and the preparation of all publicity.

P. J. Gallagher will replace Warner as sales manager of the Atlantic division. Gallagher formerly was sales manager of the lubricated plug valve of H. K. Porter Co., recently purchased by Ohio Injector. Also a specialist in the field of valve sales, he will be headquartered in Philadelphia.

New California Field Office Opened by Schlumberger

Fullerton, Calif., is the site of a new field office recently opened by Schlumberger Well Surveying Corp., which will provide services for inland fields of the Los Angeles Basin.

The new office will be under the management of Charles C. Arnold. Arnold is a mechanical-engineering graduate of University of Illinois. He joined Schlumberger in 1948 as a field engineer and has worked in the Long Beach, Bakersfield, and Coalinga, Calif., district offices.

Cathodic Protection Gets City of Houston Contract

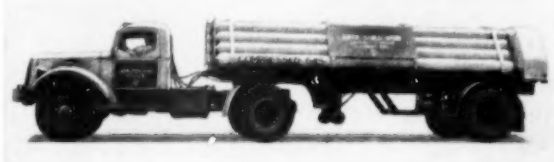
Cathodic Protection Service, of Houston, Tulsa, and New Orleans, was recently awarded large packaged cathodic-protection contracts. The contract in the amount of $134,500 covers the complete preliminary engineering survey, completion of the detailed design, and furnishing of all labor, materials, installation equipment, final checking, testing, and adjustment of currents and potentials to provide complete cathodic protection to the entire underground gas-distribution system owned and operated by the city of Houston.

Houston's distribution system is one of the three gas-utility systems in the city and is one of the oldest distribution systems in the area. It consists of some 250 miles of distribution mains, laterals, and service lines. Except for a few thousand feet of cast-iron pipe, the bulk of the system consists of steel piping. Most of the mains and laterals are either bare or poorly coated. A large percentage of the service lines are relatively well coated since many services represent replacements made during recent years after adoption of the more modern coating program.

Why?—Because there's no rolling, lifting or sliding heavy cylinders when high pressure gases are delivered the Taylor-Wharton way.

In fact, there's no exchange problem at all. The first to appreciate this are customers, shipping and receiving personnel and drivers. Each T-W Gas Transport replaces 200-400 conventional high pressure cylinders, and can be delivered as a unit to remain right at the user's plant. When exhausted, the transport is returned to producing point for re-load.

Rugged design, careful workmanship plus our vast experience in producing seamless steel gas cylinders combine to make Taylor-Wharton Gas Transports the safest possible. Gross weight is 28,000 lbs., including 30 tubes mounted on single axle with 2-speed landing gear and air brakes. Write for details.



Units now in use carrying:

- Oxygen
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- Helium
- Boron Trifluoride
- Hydrogen

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TULSA 3, OKLAHOMA

TELEPHONE:
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● To better meet the increasing demand for Humdinger Pumps throughout the southwest . . . the RALPH B. CARTER COMPANY is pleased to announce the appointment of two new representatives—the ALLIGER & SEARS COMPANY for Texas, New Mexico and western Louisiana—and the CHARLES WHEATLEY COMPANY for Oklahoma.

Both Companies will facilitate more efficient sales, service and rentals of Humdinger Pumps, by appointing dealers to service the oil, irrigation and construction fields.

Interested oil supply companies and equipment dealers may obtain complete information on the entire line of CARTER HUMDINGER PUMPS, including the new Humdinger Twin-Coaxial Self-Priming Centrifugals—by contacting the representative for their area.

DEALERSHIPS AVAILABLE

A complete line of pumps for the Oil, Irrigation and Construction Fields.

•

ALL SIZES OF
Self-Priming Centrifugals
Single and Double Diaphragms
High Pressure Pumps

•

Contact Representative in your area!

RALPH B. CARTER CO.
HACKENSACK, N. J.

Pipe-Line Construction

PIPE-LINE activity as reported below by The Oil and Gas Journal is compiled from information received from pipe-line companies and contracting firms.

These projects include those planned, proposed, under way, and contracted. Uncontracted projects are indicated by a • preceding the company name.

Crude-Oil Pipe Lines

• **California - Oregon Pipe Line System**—103 miles 6-in., proposed, Crescent City, Calif., to Medford, Ore.

• **R. A. Goodall.**—45 miles, 6-in., planned, Little Beaver to Merino, Colo. (To connect with Sterling system).

• **Gulf Refining Co.**—55 miles, 12-in., planned. Bay Marchand to Plaquemines, La.

Humble Pipe Line Co.—71 miles, 16-18-in., under way, East Texas to Louisiana - Texas border. (30 miles of 16-in., and 41 miles of 18-in.) O. R. Burden Const. Corp. Completion date 10-53.

Under way Longview to Louisiana border.

• **Interstate Oil Pipe Line Co.**—116 miles, 22-in., planned, Shreveport to Baton Rouge, La.

Interstate Oil Pipe Line Co.—55 miles, 16-in., under way, Raceland to Anchorage, La. L. E. Farley.

Plaquemine to Anchorage, La.

Lakehead Pipe Line Co.—635 miles, 30-in., under way, Superior, Wis., to Sarnia, Ontario, Canada. Project managed by Bechtel Corp., Saginaw, Mich.

Superior to Wisconsin-Michigan state line. Mahoney Contr.

Mackinaw City to Red Oak, Mich. Bechtel Corp.

Red Oak via Bay City to International Boundary south of Port Huron on St. Clair River. Conyes Const.

Water crossings of Mackinaw, Saginaw, and St. Clair rivers, Merritt-Chapman & Scott Corp., W. J. Meagher & Sons, Inc., and Midwestern Constructors.

Under way, Michigan - Wisconsin State line through Crystal Falls to Cooks, Mich. Anderson Bros. 9-15-53.

Under way, Cooks to St. Ignace, Mich., on Straits of Mackinac. Midwestern Constructors, Inc.

• **Magnolia Pipe Line Co.**—29 miles, 8-in., planned. Midland County, Texas area.

Magnolia Pipe Line Co.—Under way 154 miles, 16-in., Corsicana to Ringgold, Tex. H. B. Zachry.

• **Pasotex Pipe Line Co.**—146 miles, 10-in., planned. Snyder to Wink, Tex.

Phillips Pipe Line Co.—26 miles, 8-in., under way, northeast area of Andrews County, Texas.

18 miles, under way, gathering lines, northeast area of Andrews County, Texas.

• **Progress Pacific Pipeline Co.**—1,100 miles, 24-in., planned, Odessa, Tex., to Los Angeles, Harbor, Calif.

• **Roosevelt Oil & Refining Corp.**—22 miles, 4 and 6-in., planned St. Helen to Norwich, Mich.

Service Pipe Line Co.—153 miles, 12-16-in., under way, Tioga-Beaver Lodge area to Mandan, N. D. O. R. Burden Const. Corp.

55 miles, 4-6-8-in., under way, Tioga-Beaver Lodge area gathering system. C. P. Bartley & Son.

Texas New Mexico Pipe Line Co.—Contracted 52 miles, 10-in., Dawson County to Basin System, McVean & Barlow.

Texas Pipe Line Co.—34 miles, 6-in., under way, Sour Lake to Port Arthur, Tex. Houston Contracting.

45 miles, 8-10-in., under way, between Erath and Bayou Sale stations. Houston Contracting Co.

• **West Coast Pipeline Co.**—960 miles, 20-22-in., planned, Wink, Tex., to Norwalk, Calif.

Products Pipe Lines

Augusta Pipe Line Co.—Under way, 43 miles, 8-in., from Arkansas City to Augusta, Kans. Ray L. Smith & Son, Inc.

• **H. W. Bass & Sons, Inc.**—152 miles, 4-6-in., proposed. Duval and Live Oak counties, Texas, to Corpus Christi, Tex.

Buckeye Pipe Line Co.—370 miles, 10-14-16-in., under way, Linden, N. J., via Allentown, Pa., to Auburn, Syracuse, Waterloo, and Rochester, N. Y. 9-53.

Guthsville to Dupont, Pa. Pipe Line Const. & Drilling Co.

Dupont north to Pennsylvania-New York state line. Fulghum Contr. Corp.

Pennsylvania-New York state line to Auburn, N. Y. Williams-Austin.

Auburn to Syracuse, N. Y. Williams-Austin.

Auburn to Caledonia, N. Y. Universal Map and Survey Co.

• **Continental Pipe Line Co.**—(Yellowstone Line)—600 miles, 8-in., planned, Billings, Mont., to Spokane, Wash. (Joint ownership of Sinclair Pipe Line Co., Gulf Refining Co., and Texas Pipe Line Co.)

Harbor Products Systems—36 miles, 16-in., under way, Woodbury Junction, Philadelphia to Trembley Point, N. J. Construction Service Co. and H. C. Price Co. (Joint ownership of Sinclair Pipe Line Co., Gulf Refining Co., and Texas Pipe Line Co.)

Indiana Farm Bureau Cooperative Association, Inc.—180 miles, 8-in., under way, Mt. Vernon to Indianapolis, Ind. R. B. Potashnick, contractor. 8-15-53.

52 miles, 4-in., under way, Indianapolis to Peru, Ind. R. B. Potashnick, contractor.

• **Inland Empire Pipe Line Co.**—504 miles 10-in., proposed, Billings, Mont., to Spokane, Wash.

Kaneb Pipe Line Co.—Under way, 246 miles, 8 and 10-in., Wichita, Kans. to Fairmont, Neb. Ray L. Smith & Son, Inc.

• **Phillips Petroleum Co.**—54 miles, 6-in., planned, Goldsmith to Borger, Tex.

52 miles, 10-in., planned, Shell's Brookshire system to Sweeny, Tex.

Plantation Pipe Line Co.—82 miles, 14-in., under way, Charlotte to Greensboro, N. C. Anderson Bros.

Salt Lake Pipe Line Co.—140 miles, 8-in., under way, Pasco to Spokane, Wash. Lyles & Young Co. Completion date 10-1-53.

Standard Oil Co. (Ind.)—243 miles, 10-12 in., under way, Whiting, Ind. to River Rouge, Mich.

Calumet district, Indiana, Morrison Construction Co.

Lake County, Indiana boundary to Colon, Mich., Somerville Construction Co.

Colon to Romulus, Mich. R. B. Potashnick.

Romulus to River Rouge, Mich. R. L. Coolsaet Construction Co.

Standard Oil Co. (Ind.)—207 miles, 8-in., under way, Mandan, N. D. to Moorhead, Minn. Associated Pipe Line Contrs. 12-53.

• **Sunray Oil Corp.**—440 miles, 10-in., planned, Duncan, Okla., to Mississippi River.

Sun Pipe Line Co.—50 miles, 8-in., under way, Toledo, Ohio to Inkster Junction west of Detroit. 10-53. R. L. Coolsaet Const. Co. and Poston Pipe Line Co.

• **United States Pipe Line Co.**—1,799

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Other exclusive features include: a rotating valve seat to assure proper seating; encased springs to prevent fouling; trip mechanism which accommodates any length trip rod. Sturdily built for longer service. Available in five sizes: 12, 16, 18, 24 and 36 inches. Available through all supply stores.

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miles, 22-26-in., proposed, Beaumont, Tex., to Newark, N. J.

Beaumont, Tex., to Memphis, Tenn.

Memphis, Tenn., to Louisville, Ky.

Louisville, Ky., to Newark, N. J.

Laterals to Paducah and Lexington, Ky.

• **Williston Basin Pipe Line Co.**—244 miles, 8-in., proposed, Laurel-Billings, Mont., refineries to Glendive, Mont.

Wolverine Pipe Line System—200 miles, 14-in., Chicago-Toledo-Detroit. (Joint ownership of Shell, Texas and Cities Service.) Completion date 1-54.

East Chicago, Ind. to Kalamazoo River, Midwestern Constructors, Inc.

Marshall to Detroit, Mich. Anderson Brothers Corp.

Natural-Gas Pipe Lines

American Natural Gas Co.—Proposed. Lowry, La., to Detroit, Mich. 1,000 miles, 30-in.

• **Arkansas-Missouri Power Co.** — 140 miles, 2 to 10-in., planned, St. Francis River, Clay County, Arkansas, to near Campbell, Mo.

• **Associated Natural Gas Co.**—88 miles, Missouri.

• **Atlantic Seaboard Corp.**—29 miles, 26-in., proposed, looping along Cobb-Rockville line.

• **Carolina Natural Gas Corp.**—185 miles, 2-12-in., proposed, lateral lines off Transcontinental in North and South Carolina.

• **Chattahoochee Natural Gas Co.**—70 miles, proposed, Floyd County, Georgia to Dalton, Ga.

• **Chicago District Pipe Line Co.**—35 miles, 24-30-in., proposed, Chicago area.

• **Cities Service Gas Co.**—18 miles, 16-in., Lawrence and Newton counties, Missouri.

69 miles, 20-16-in., proposed, Cleveland, McClain, and Garvin counties, Oklahoma.

• **City of Fayette, Ala.**—20 miles, 5-in., proposed, Fayette, Ala., to Southern Natural's system in Tuscaloosa County, Ala.

• **Kansas-Nebraska Natural Gas Co.**—41 miles, 10-12-in., proposed, Kansas and Nebraska.

• **Coast Counties Gas & Electric Co.**—40 miles, 3, 4, and 8-in., planned. Coast and Valley region, California.

• **Colorado Interstate Gas Co.**—365 miles, 22-in., proposed, Green River, Wyo., to Denver, Colo. 1954.

116 miles, proposed, Colorado, Oklahoma, Texas, and Kansas. 1953.

• **Cumberland and Allegheny Gas Co.**—31 miles, 12-in., proposed, Garrett County, Md., to Keyser, W. Va.

East Tennessee Natural Gas Co.—158 miles, 16-in., under way, Knoxville to Kingsport, Tenn. (58 miles of laterals.) 11-53.

• **El Paso Natural Gas Co.**—1,178 miles, proposed, Permian basin, New Mexico, Texas and Colorado.

El Paso Natural Gas Co.—Under way, 771 miles, 30-in., Plains, Tex. to Kingman, Ariz. 567 miles contracted by Oklahoma Pipe Line Constructors, R. H. Fulton and Co. and Western Pipe Line Contractors. 204 miles to be built by El Paso Natural construction organization.

• **Fort Worth Basin Gas Co.**—Planned, Novice, through Brown and Comanche counties, Texas.

• **Glacier Gas Co.**—285 miles, 20-in., proposed, Kalispell, Mont., to Spokane, Wash.

120 miles, 16-in., proposed, Spokane to Hanford, Wash.

91 miles, 8⅝-in., proposed, Spokane to Lewiston, Idaho.

130 miles, 12¾-in., proposed, Spokane to International boundary at Trail, British Columbia.

Gulf Interstate Gas Co.—860 miles, 30-in., under way. Acadia Parish, La., to Boyd County, Ky. H. C. Price and Houston Contracting. 11-54.

Rayne, La. to Kincade, Tenn. Houston Contr.

Under way (north section) Kincade, Tenn., to Kenova, W. Va. H. C. Price.

(Southern section) Lake Charles, La., to Kincade, Tenn. Houston, Constr.

230 miles, gathering lines, contracted, Associated Pipe Line Contractors, Anderson Bros., Williams Bros.

329 miles, 12 to 24-in., proposed. Laterals off Acadia Parish, Louisiana, to Boyd County, Kentucky, line.

• **Home Gas Co.**—32 miles, 12-in., planned, Breesport to Union Center, N. Y.

17 miles, 12-in., proposed, loops from Hansock to Sanford, N. M.

Home Gas Co.—46 miles, 12-in., under way, Tioga and Broome counties, New York. H. L. Gentry Const.

22 miles, 12-16-in., under way, Binghampton, N. Y.

• **Interstate Power Co.**—26 miles, 8-in., proposed, from Nat. Gas P. L. Co. America line near Hooppole, Ill., to Clinton, Ia.

Iowa-Illinois Gas & Electric Co.—41 miles, 10-in., start last half '53, Washington County to Cedar Rrapids, Iowa.

Kansas-Nebraska Natural Gas Co., Inc.—54 miles, 4-6-in., under way, Neligh to Hartington, Neb. Brodie Constr. 9-53.

42 miles, 4-6-in., under way, Neligh to O'Neil, Neb. Brodie Const. 9-53.

61 miles, 3-2-in., under way, lateral lines from Broomfield through various towns to Wausa, Neb. Brodie Const. Co. 9-53.

• **Lone Star Gas Co.**—100 miles, proposed, storage fields to the Dallas-Fort Worth area.

35 miles, 12-in., proposed, southeastern Schleicher County.

• **Manufacturers Gas Light & Heat Co.**—40 miles, proposed, Allegheny, Washington, and Beaver counties, Pennsylvania.

213 miles, 3 to 26-in., proposed, various points on system in Pennsylvania, West Virginia, and Ohio.

• **Mississippi River Fuel Corp.**—109 miles, 10-18-in., planned, laterals in Woodlawn and Waskom gas fields, Texas.

Missouri Central Gas Co.—25 miles, 6-in., contracted, Moberly to Macon, Mo. L. R. Young Const. Co.

• **Missouri Public Service Co.**—136 miles, 8-10-in., proposed, New Franklin to Trenton, Mo.

24 miles, 10-in., Johnson County to Clinton, Mo.

• **Montana Power Co.**—52 miles, 16-in., planned, Canada-Montana border to Cut Bank, Mont.

• **Morganfield Natural Gas Co.**—31 miles, 4-6-in., planned, through Sturgis, Providence, Clay, Diamond, Wheatcroft, and Sullivan, Ky.

• **Natural Gas Producer Inc.**—100 miles, 12-in., planned, Yenter pool to Denver, Colo.

• **Nevada Natural Gas Pipe Line Co.**—114 miles, 12¾-in., proposed, Topock, Ariz., to Las Vegas, Nev.

• **New River Gas Co.**—50 miles, planned, Summers to Monroe counties, West Virginia, to Narrows and Dublin, W. Va.

• **New York State Electric and Gas Co.**—59 miles, 8-10-24-in., proposed, Oneonta and Norwich to DeRuyter, N. Y.

Niagara Mohawk Power Co.—55 miles, 10-in., under way. Watertown to Syracuse, New York. Williams-Austin Co. 8-1-53.

• **Northern Indiana Fuel & Light Co.**—33 miles, 8-in., proposed, Edgerton to Auburn, Ind.

• **Northern Natural Gas Co.**—458 miles, proposed, Kansas, Texas, Oklahoma, and Nebraska, Iowa and Minnesota to connect with Permian Basin System.

475 miles, proposed branch lines to Iowa, Nebraska, Minnesota and South Dakota.

Northern Natural Gas Co.—Section No. 1, 92 miles, 30-in., under way, Dumas via Sunray to main line north of Canadian River.

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Specify
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Turbines
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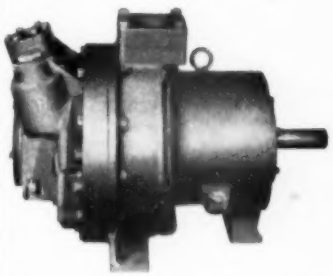

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Texas, and two loops near Beaver station, Oklahoma, R. H. Fulton & Co.

Northern Natural Gas Co.—Section 2, 70 miles, 30-in., contracted, loops near Mullinville, Bushton and Clifton stations, Kans., and Palmyra station, Neb. Lone Star Constructors.

Northern Natural Gas Co.—Section 3, 94 miles, 24-in., and 30-in., contracted loops near Paulina, Ogden, and Oakland stations, Iowa, G. G. Griffis Construction Co.

• **Northwest Natural Gas Co.**—750 miles, planned, Washington, Oregon, and Idaho.
24-in., Eastport, Idaho, to Monroe, Wash.
18-in., Monroe to International boundary near Lynden, Wash.
22-in., Monroe to near Seattle, Wash.
20-in., Seattle to Portland, Ore.

• **Ohio Fuel Gas Co.**—31 miles, 20-in., planned, Licking County to Richland County, Ohio.
22 miles, 16-in., planned, Dayton, Troy, Piqua, and Sidney, Ohio.
23 miles, 16-20-in., planned, Wellington to Elyria, Ohio; 16 miles, 20-in., planned, Benton Station to Crawford Station; 18 miles, 20-in., Crawford Station to near Columbus; 16 miles, 16-in., planned, Berlin to Sandusky, Ohio.
74 miles, 3 to 20-in., planned, Hocking, Knox, and Ashland counties, Ohio.
47 miles, 20-in., planned, Benton Township, Hocking County, to Columbus, Ohio.
61 miles, planned, northern and southwestern Ohio.
33 miles, 20-in., proposed, Jefferson to Seneca, Ohio.
69 miles, 20-24-in., proposed, lines to tiein Gulf Interstate line along various points in Lawrence, Jackson, Vinton, Hocking and Fairfield counties, Ohio.

• **Pacific Gas & Electric Co.**—50 miles, 12-16-20-in., planned, Fresno to Merced, Calif.
(Section 2) 20-in., Holm to Topock-Milpitas line.
(Section 3) 12-in., parallel existing Madera-Livingston line, planned. Napa Wye to Shellville; Cotati to Santa Rosa, Calif.
170 miles, 34-in., proposed, main-line loops along Topock, Ariz., to Milpitas, Calif.

Pacific Gas & Electric Co.—86 miles, 34-in., under way, parallel sections along Topock-Milpitas line. Engineers Pipe Line, Ltd. Summer 1953.

• **Pacific Northwest Pipeline Corp.**—1,466 miles, proposed, Ignacio, Colo., to Bellingham, Wash.
380 miles, proposed, laterals and spurs off main line to Pocatello, Idaho, to Yakima, Wash.

Permian Basin Pipeline Co.—234 miles, 16-24-26-30-in., contracted, West Texas and New Mexico. R. H. Fulton & Co.

Public Service Co. of Colorado — 34 miles, under way, Douglas Creek and other gas fields to Grand Junction, Colo., area. Foutz & Buraum Const. Co. 9-1-53.

• **Rockland Light & Power Co.**—22 miles, 8-in., proposed, Orangetown to Tompkins Cove, N. Y.

• **Shenandoah Gas Co.**—39 miles, 3-4-8-in., proposed, Middleton, Va., to Martinsburg, W. Va.

Signal Oil and Gas Co.—170 miles, 3½-34 in., under way, Tioga-Beaver Lodge gathering system. Completion date 9-53.

• **South Carolina Natural Gas Co.**—160 miles, 16-12-10-in., proposed, Aiken, S. C., to cities of Columbia, Summerville, and Charleston, S. C.

• **South Georgia Natural Gas Co.**—339 miles, 2-12-in., planned, Phoenix, Alta., to Tallahassee, Fla. (a) 12-in., Phoenix, Ala., to Albany, Ga., (b) 10-in., Albany, Ga., to Moultrie, Ga., (c) 8-in., Moultrie, Ga., to Tallahassee.

• **Southern California Gas Co., and Southern Counties Gas Co.**—73 miles, 30-in.,

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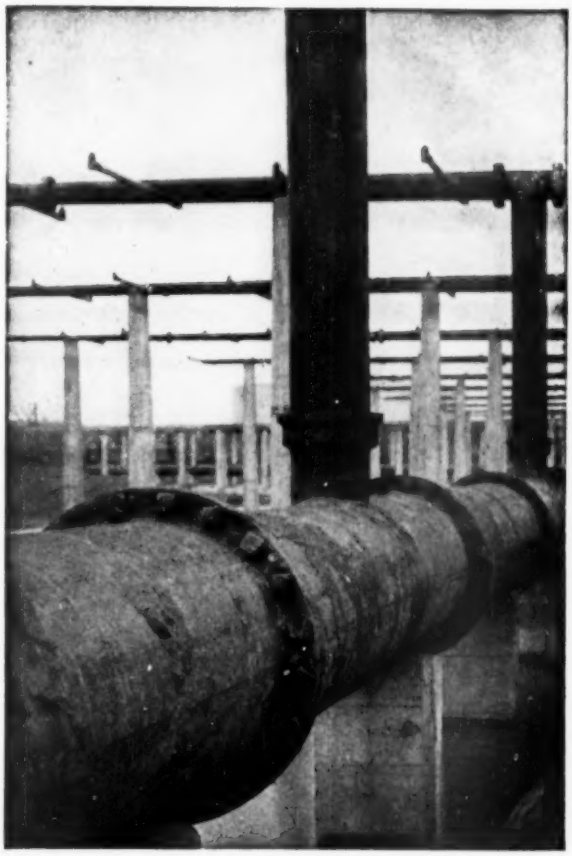

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planned, loops on main line from Blythe to Los Angeles.

Southern Natural Gas Co.—1,235 miles, 24 to 4½-in., under way, Louisiana, Mississippi, Alabama, and Georgia, and South Carolina. Houston Contracting and H. C. Price. Fall 1953.

Gwinville, Miss., to Lake Pontchartrain, La. Houston Contr. 8-53.

Bass Junction, Ga., to South of Wrens, Ga. Houston Contr.

• **Southwest Gas Corp., Ltd.**—26 miles, proposed, from P.G.&E. line to Victorville, Calif.

• **Tennessee Gas Transmission Co.**—574 miles, 30-in., proposed, Kinder, La., northeast through Louisiana, Mississippi, to Portland, Tenn.

130 miles, proposed, looping in Texas and Louisiana. Including 67 miles of 30-in. line.

63 miles, 26-in., proposed, loop near Greenup, Ky., and Mercer, Pa.

45 miles, 20-in., proposed, Buffalo, N. Y., to the U. S.-Canadian border Hamburg station near St. Catherines.

Tennessee Gas Transmission Co.—Under way, 20 miles, 30-in., Nachitoches, La., to Goldonna, La. Oklahoma Contracting Co.

18 miles, 30-in., under way, Middletown to Selmer, Tenn. Oklahoma Contracting Co.

35 miles, contracted, Campbellsville, Ky., to Danville, Ky. Western Pipe Line Constructors.

21 miles, 26-in., under way, Carter, Ky., to Ohio River. Western Pipe Line Constructors.

70 miles, 24-in., under way, Mercer, Pa., to Pigeon, near Coudersport, Pa. H. C. Price Co. 8-53.

60 miles, 24-in., under way, Pigeon, Pa., to Hebron field, Porter County, Pennsylvania. Bechtel Corp.

• **Texas-Ohio Gas Co.**—1,435 miles, 30-in., proposed, Hidalgo County, Texas, through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va.

• **Trans-Northwest Gas, Inc.**—246 miles, proposed, International Boundary near Osoyoos, B. C., to Washington and Idaho.

275 miles, branch lines.

• **United Fuel Gas Co.**—50 miles, 20-24-in., proposed, Wood County to Lanham, W. Va. Spring 1954.

32 miles, 24-in., proposed, near Ripley, W. Va., to Lanham station, Putnam County, W. Va.

60 miles, 30-in., proposed, Lanham in Kanawha County, West Virginia, to Gulf Interstate line in Boyd County, Ky.

• **United Gas Pipe Line Co.**—44 miles, 20-in., planned, Lirette field to Harvey, La.

• **United Natural Gas Co.**—50 miles, 12-in., planned, Elk County to Jefferson County, Pennsylvania.

• **Utah Natural Gas Co.**—103 miles, 16-18-in., proposed, Clear Creek field near Price to Salt Lake City, Utah.

18-in., Clear Creek to Provo, Utah.

16-in., Provo to Salt Lake City, Utah.

Virginia Natural Gas Co.—153 miles, Buckingham to Richmond and Portsmouth, Va.

Warren Petroleum Corp.—78 miles, 2-24-in., proposed, Lovington, N. M. Completion date 9-53.

Westcoast Transmission Co., Ltd.—(See foreign natural gas pipe lines).

Western Slope Gas Co.—34 miles, 8-in., under way, Garmesa to West Douglas Creek, Colo. 8-53.

Foreign Crude-Oil Pipe Lines

Basrah Petroleum Co.—65 miles, 24-in., under way, Zubair to Fao, Iraq. Completion date 10-53.

• **Creole Petroleum Corp.**—25 miles, 34-in., planned, Lagunillas to La Salina (State of Zulia, Venezuela.)

Direccion General de Yacimientos Petroli-

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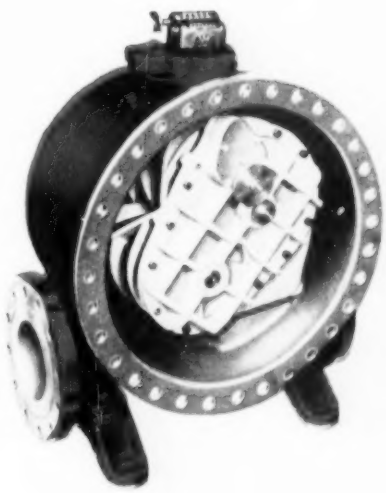

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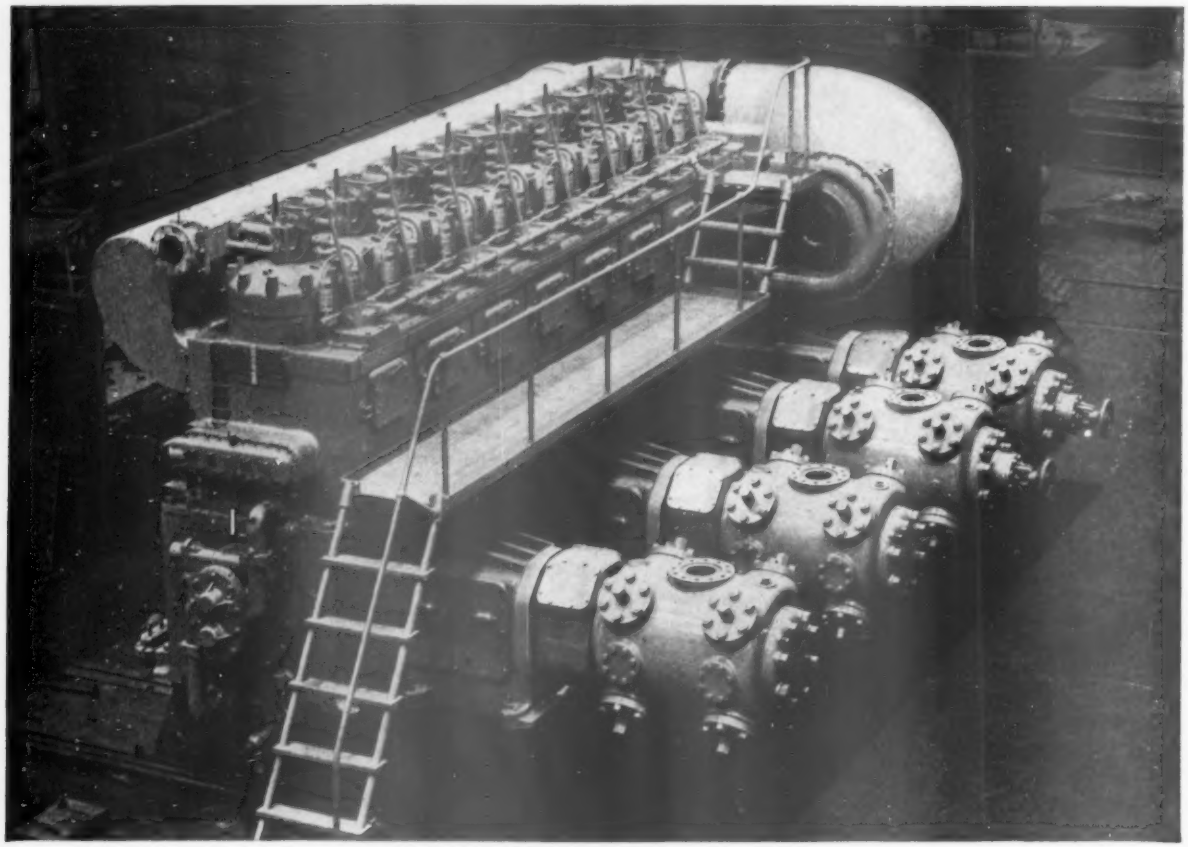


Clark 2-Cycle Turbocharged "Right Angle" Heralded As Most Significant Development In Compressor History

Revolutionary changes in gas-engine-driven compressor design set new records for power (50% increase), fuel economy (10-15% decrease) and cooling water load (25% decrease)

THE recently developed Clark 2-Cycle Turbocharged Right Angle Compressor has set new, industry-wide standards for power and operating economies, reports Clark Bros. Co., Olean, N. Y.

Climaxing an intensive 7-year Clark development program, the availability today of this completely new, turbocharged compressor design provides the realistic and ready answer to increasing cost of gas, inadequate cooling water supply in certain areas and the need for more powerful, more compact units. Clark engineers list the following points in support of these claims:

50% More Power

Fifty percent (50%) more power is delivered than by any previously built non-turbocharged unit of comparable bore and stroke (without any encroachment on overload carrying ability). The stepped-up power output means reduced building, foundation, piping and maintenance costs as well as decreased operating personnel.

10-15% Less Fuel Consumed

Conservatively rated, the new Clark unit is guaranteed to burn 10 to 15% less fuel than the best non-turbocharged, high compression, gas-engine-driven compressor previously built.

25% Less Cooling Water Load

Cooling water requirements per bhp are twenty-five percent (25%) less than those of the best non-turbocharged, high compression, gas-engine compressor previously built (including scavenging air

Advertisement

intercooling duty). This is important not only in arid locations, but means fewer cooling towers, smaller pumps, smaller piping and smaller motors to drive water pumps.

Flat Fuel Consumption Curve

Fuel consumption remains practically constant between seventy percent (70%) of load and maximum load, assuring optimum fuel economy over the entire operating range.

Quiet Operation

Energy, formerly lost in noise, is now harnessed for useful work by the Clark Turbocharger. This, plus a fully insulated exhaust manifold and en bloc construction, make it the quietest, smoothest operating gas-engine-driven compressor ever built. There are no exhaust pulsations.

UNITIZED, MATCHED DESIGN

Both turbocharger and compressor were designed and built by Clark as matching components. The result, say Clark engineers, is a highly efficient, unitized and integrated design.

The Turbocharger

The Clark turbocharger combines many of the design principles of Clark radial inflow turbines, combustion gas turbines and centrifugal compressors.

As applied to the new Clark Compressor, turbocharging is a practical means of converting waste heat into energy. It utilizes the waste heat, velocity and mass flow of the exhaust gases to drive a radial inflow turbine. The turbine, in turn, is integrally connected to a centrifugal compressor impellor which pumps air to scavenge the power cylinders and to furnish air for combustion. No scavenging cylinders are used or required.

At start-up and on light loads, the turbocharger is direct driven through a gear train from the engine crankshaft. Under all other load conditions, the turbocharger operates independently of the engine, its speed automatically conforming to the load placed on the engine.

Because the Clark turbocharger operates at very conservative speeds and temperatures, no critical, scarce materials are required for its construction.

The Compressor

While the gas-engine-driven compressor is an entirely new unit, specially designed to match the characteristics of the new Clark turbocharger, it retains many of the basic Clark "Angle" design features. Clark engineers describe it as the most rugged compressor ever built, "with a very conservative BMEP rating for a unit of its proportions."

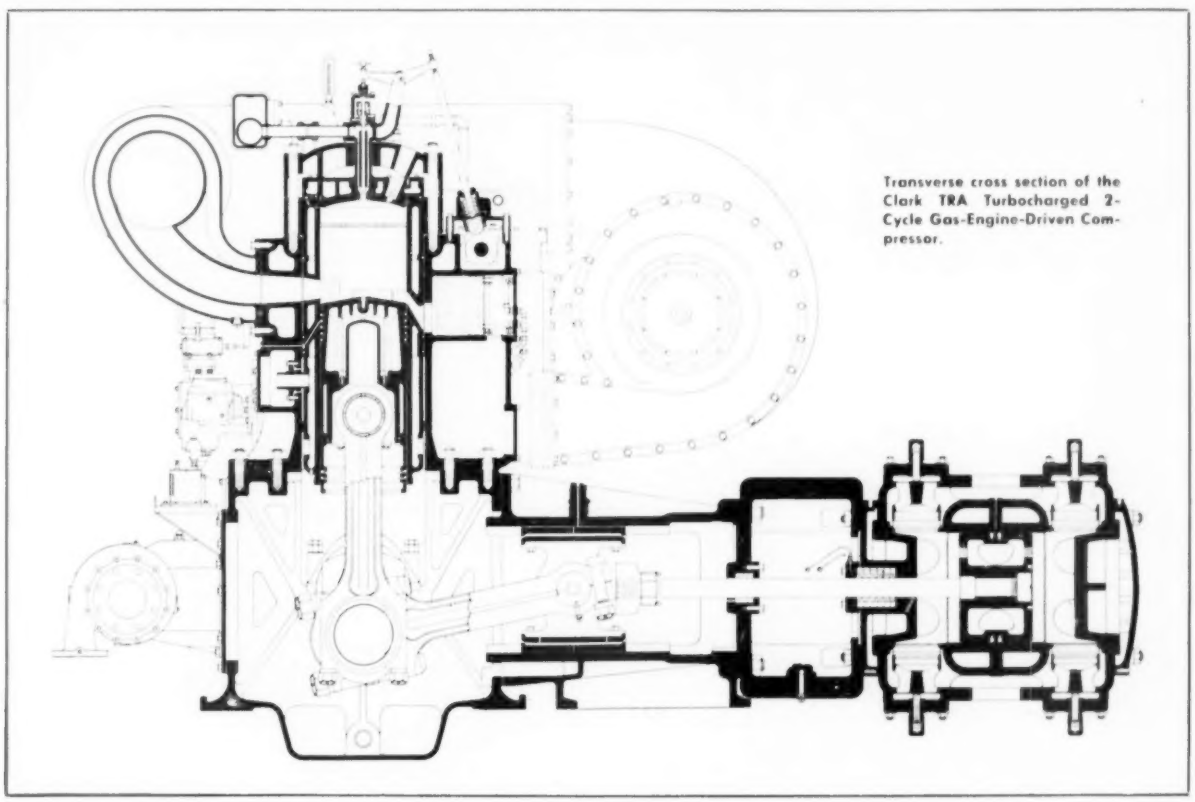
Following a long established Clark practice, the new compressor is an extremely compact, yet highly accessible 2-cycle, in-line design. It occupies considerably less space per bhp than non-turbo-charged units, because of its increased power output. Featured are: Cylinder block construction with removable power cylinder liners; full precision bearings; one-piece forged steel crankshaft; oil-cooled power piston heads and skirts; heavy, forged steel connecting rods; fully insulated, streamlined exhaust system.

MODELS

The Clark Model TRA-8, illustrated, has eight vertical in-line power cylinders of 14" bore and 14" stroke, developing 1320 bhp. Other size turbocharged units also are available.

Bulletin 130, with complete information on the Clark 2-Cycle Turbocharged Gas-Engine-Driven Compressor is obtainable from Clark Bros. Co., Division of Dresser Operations, Inc., Olean, N. Y.

Clark manufactures a complete line of heavy duty compressors: motor driven; gas, steam and Diesel engine driven; centrifugal and axial flow.



Transverse cross section of the Clark TRA Turbocharged 2-Cycle Gas-Engine-Driven Compressor.

feros Fiscales—409 miles, under way, Plaza Huincul to Bahia Blanca, Argentina.

• **Gaz de France**—200 miles, 12-in. Ruhr to Paris, France.

Interprovincial Pipe Line Co.—135 miles, 24-in., under way, looping from Regina to U. S. border, Canada. Anderson International Contrs., Ltd. 8-53.

• **Petroleos Mexicanos.**—145 miles, 12-in., considered, 18 de Marzo field via Reynosa to Monterrey, Mexico.

100 miles, planned, Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.

72 miles, 12-in., proposed, Poza Rica to Atzacapotzalco, Mexico.

Petroleos Mexicanos.—125 miles, 10-in., under way, Jose Colomo to El Plan, Mexico.

• **Saskatoon Pipe Line, Ltd.**—56 miles, 6-in., planned, Milden to Saskatoon, Sask.

Texas Petroleum Co. — 60 miles, 4-6-in., under way, Pta. Nino to La Dorada.

• **Trans Mountain Oil Pipe Line Co.**—30 miles, planned, Vancouver, B. C., terminal to Ferndale, Wash.

Trans Mountain Oil Pipeline Co.—711 miles, 24-in., under way, Edmonton, Alta., to Vancouver, B. C. Canadian Bechtel, Ltd., engineers. Completion date 8-53.

Edmonton to Acheson, Canadian Pipe Line Const. 8-53.

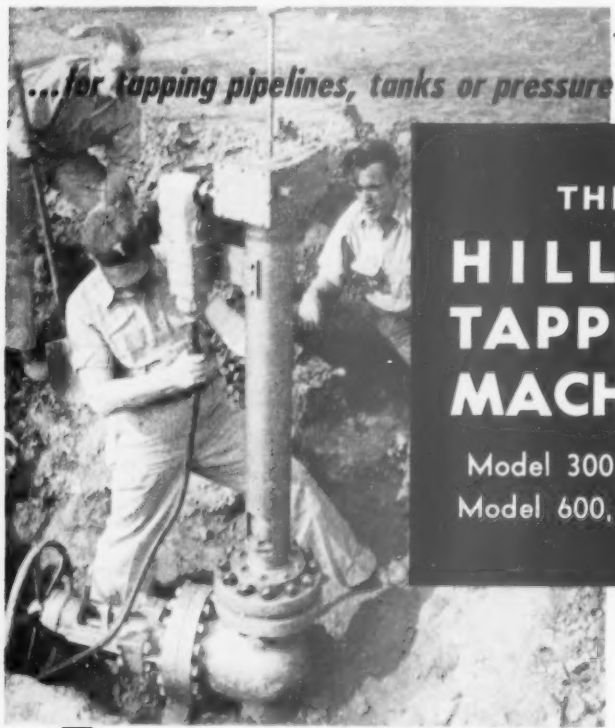
Jasper to Blue River, B. C., Comstock Midwestern. 8-53.

Blue River, B. C., to Coquehalla, B. C., Mannix, Ltd. 8-53.

Chilliwack to Coquehalla, B. C. Comstock Midwestern. 8-53.

Sumas to Vancouver, B. C., Comstock Midwestern. 9-53.

• **Yacimientos Petroliferos Fiscales Bolivianos.**—170 miles, 4-in., planned, Bermejo to Tupiza, Bolivia.



THE HILLCO TAPPING MACHINE

Model 300, 1" - 4"
Model 600, 2" - 16"

The HILLCO Tapping Machine is designed to tap high-pressure or high-temperature pipelines, tanks or pressure vessels (Oil, Natural Gas, Gasoline, or Water). For tapping through gate valves from 1" to 16" (Plug Valves 2" to 4". Special cutters are available for use with other valves having restricted openings). Larger sizes designed to operate with air motor. The HILLCO Tapping Machine is shop tested at 2000 p.s.i. for operation at 1000 p.s.i., and is also equipped with high-temperature packing.

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Foreign Products Pipe Lines

Columbian Ministry of Petroleum—115 miles, 4-in., begin 1953, La Dorado to Cartago, Colombia, Williams Bros. Engineers.

93 miles, 8-in., begin 1953, Cantimplora to Dorado, Colombia, William Bros. Constructors.

• **Empresa Nacional del Petroleo** — 80 miles, 6⅝-in., planned, Concon to Santiago, Chile.

Empresa de Ferrocarriles Ecuatorianos.—50 miles, 6-in., contracted, Guayaquil to Palmira, Ecuador. J. A. Jones, contractor; C.R.C. Engineering Co., engineers.

• **Governments of Southern Rhodesia and Portuguese East Africa.**—200 miles, considered, Beria, Portuguese Mozambique to Umtalia, Southern Rhodesia.

• **Petroleos Mexicanos.**—124 miles, 6-in., planned, Lagos to Guadalajara, Mexico.

54 miles, 6-in., planned, Lagos to Aguascalientes, Mexico.

82 miles, 8-in., planned, Salamanca to Lagos, Mexico.

Shell Co. of Australia.—34 miles, 8-in., under way, Geelong, Melbourne Ref. to connect with installations at Newport, Australia, Taylor Woodrow. 11-53.

Sun Pipe Line Co. of Canada.—200 miles, 8-in., under way, Sarnia, Hamilton, Toronto, Ont. Williams Bros. 10-53.

• **United States Government.**—375 miles, 12-in., planned, St. Nazaire to Melun and Metz, France.

Foreign Natural-Gas Pipe Lines

• **Azienda Generale Italiana Petroli.**—110 miles, 12-14-16-in., Start 11-52. Cortemaggiore to Genoa. Completion date 11-53.

Azienda Generale Italiana Petroli — 90 miles, 12-in., under way, Cortemaggiore to Bologna, Italy, SNAM crews.

120 miles, 16-in., under way, Cremona Porto Mar to Ghera, Italy, Montubi, contractor.

40 miles, 12-in., under way, Ripalta-Bergamo, Italy.

Dirrecion General del Gas del Estado—310 miles, 8-in., under way, Plaza Huincul to Neuquen, Argentina, to the vicinity of General Conesa, Argentina.

• **Empresa Nacional del Petroleo** — 80 miles, 10-in., planned, Concon to Santiago, Chile.

• **Mid-Continent Pipelines, Ltd.** — 1,860 miles, 30-in., proposed, Alberta to Montreal, Canada. Fish Engineering Co.

• **Northwest Natural Gas Co.**—950 miles, 24-in., planned, Alberta fields to Vancouver, B. C., Seattle, Wash., and Portland, Ore.

Petroleos Mexicanos. — 205 miles, 16-in., under way, Monterrey to Torreon, Mexico.

• **Petroleos Mexicanos.**—440 miles, 20-in., planned, Brazil to Tampico to Poza Rica, Mexico.

• **Trans-Canada Pipe Lines, Ltd. (Canadian Delhi Oil Co.)**—2,247 miles, 14 to 30-in., proposed, Alberta to Toronto to Montreal.

747 miles, 8 to 24-in., gathering system in Alberta.

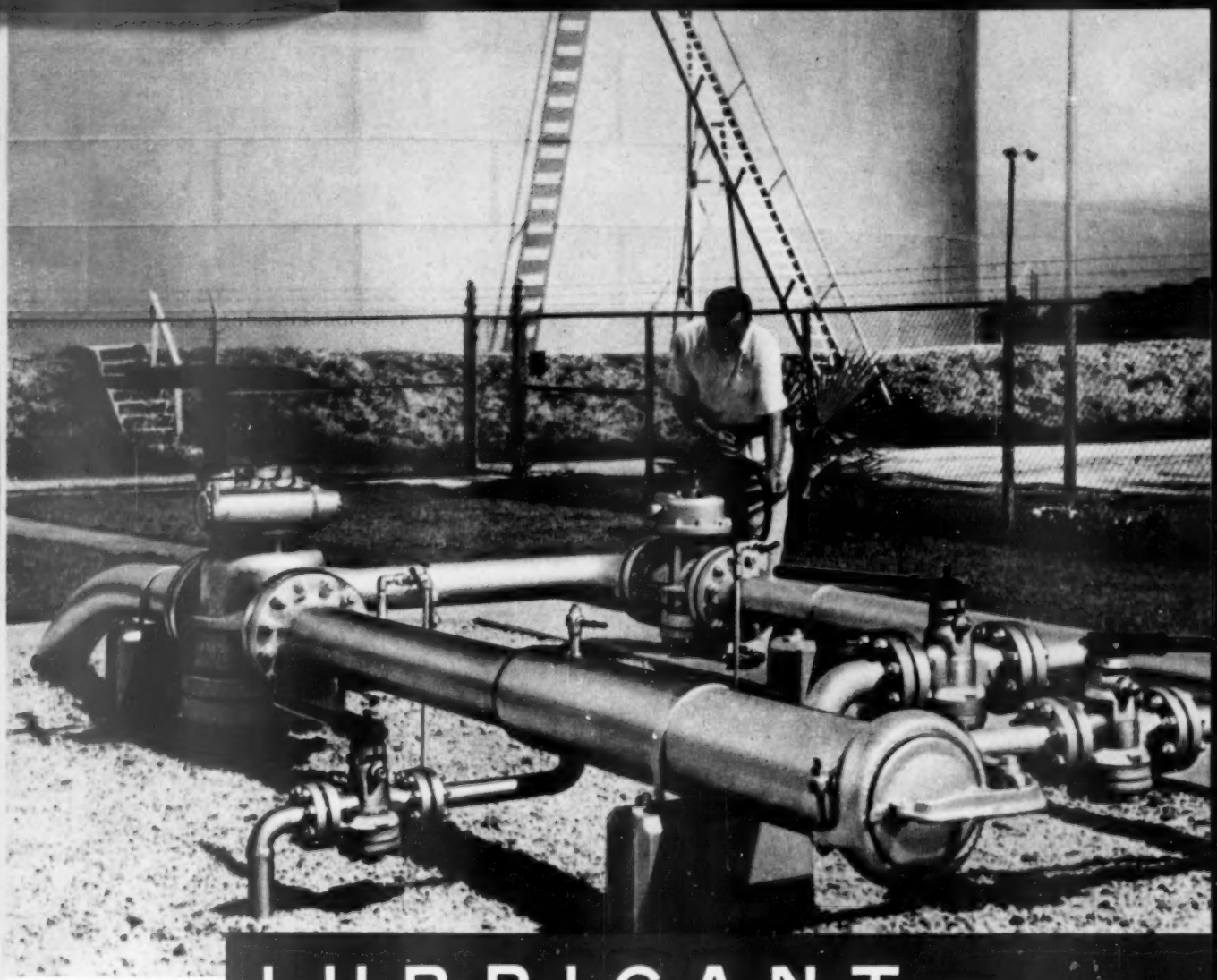
• **Westcoast Transmission Co., Ltd.**—1,110 miles, 24-in., planned, Dawson Creek, B. C., through Pine Pass and Fraser River Valley to Kamloops, Princeton, and Vancouver to Portland. Ford, Bacon & Davis, engineers.

280 miles, 20-in., planned, Pincher Creek to Montana en to Spokane, Wash. Ford, Bacon & Davis, engineers.

138 miles, 20-in., planned, Sumas to Tacoma, Wash.

139 miles, 18-in., planned, Tacoma, Wash., to Portland, Ore.

• **Western Pipe Lines.**—833 miles, 24-in., proposed, from southern Alberta, eastward across the Canadian prairies, serving principal towns and cities along the route.



LUBRICANT—
THE NORDSTROM SEAL OF APPROVAL

In any valve, if a small leak starts, high repair and replacement costs are coming up. And, if the valve is in an often-operated manifold, trouble comes to a head sooner.

Unless . . . .

. . . . the valve is a Nordstrom.

Nordstrom valves have an extra seal against those small leaks. In Nordstrom valves, an even film of plastic lubricant surrounds the valve ports, sealing off the line fluid and at the same time filling any minute point of wear. Further, since there is no seat or disk in the eroding stream of flow, the chances for wear are cut to a minimum.

It's that extra seal of lubricant that has won approval for Nordstrom valves in hundreds of services where other valves aren't quite good enough.
Rockwell Manufacturing Company, Pittsburgh 8, Pa.

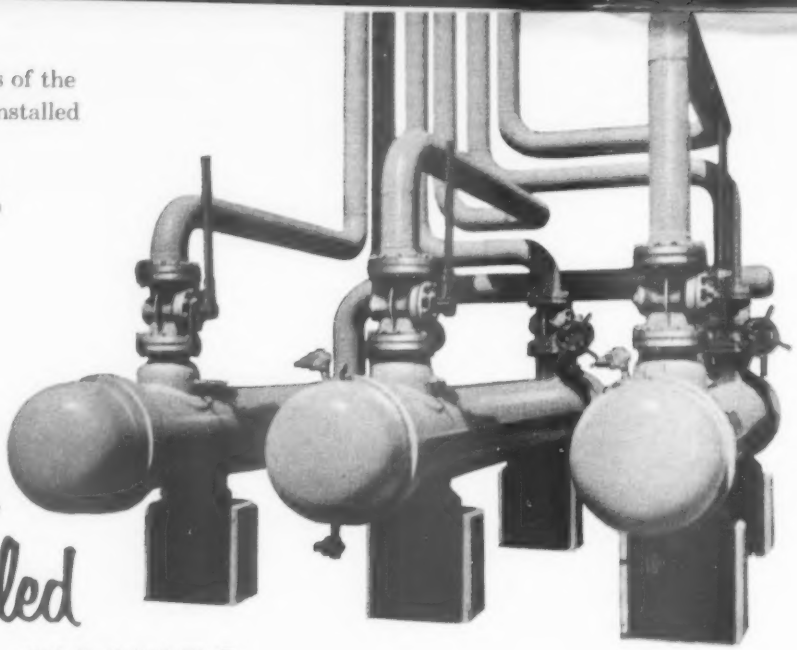
ROCKWELL Built Nordstrom Valves

Lubricant-Sealed for Positive Shut-Off

Another ROCKWELL Product

Regardless of the process, regardless of the piping arrangement, all valves are installed to do the same job:

TO CONTROL FLOW



Some valves do the job better than others. Some valves operate more easily than others in an emergency. Some valves stay tighter longer than others. That's because some (like these) are

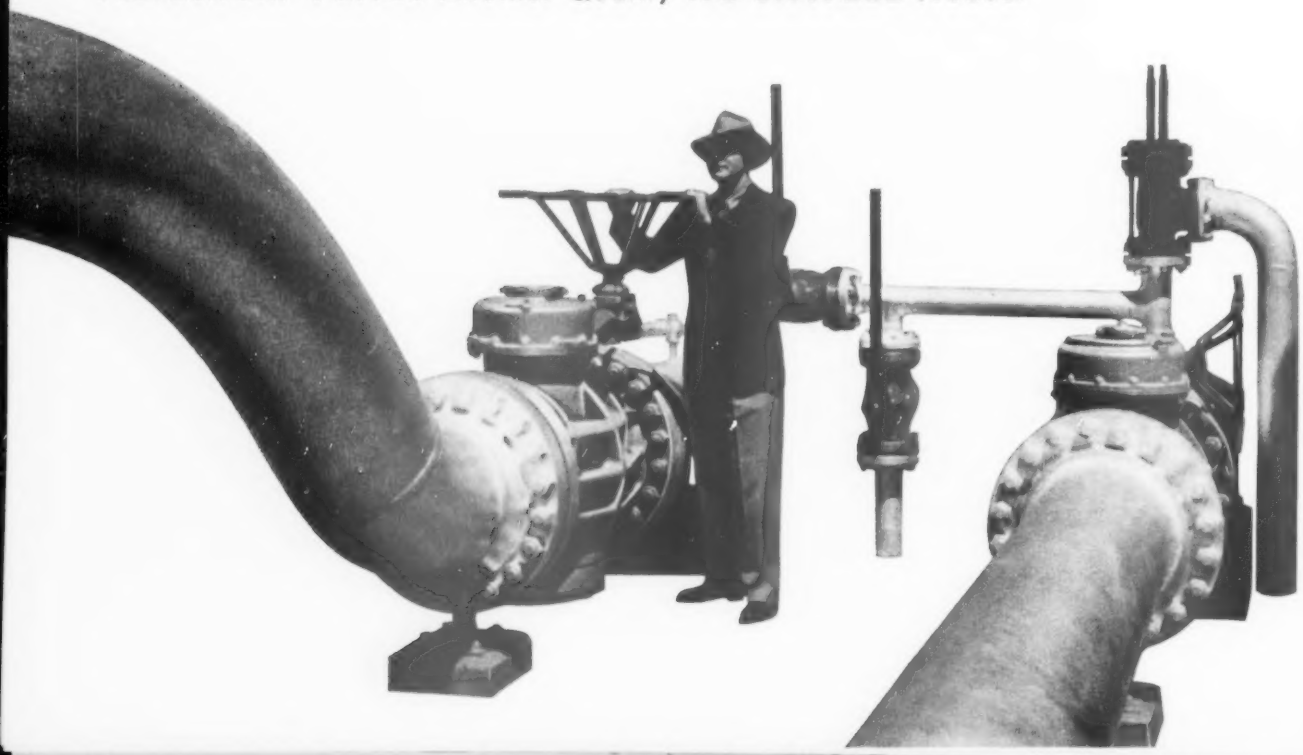
Lubricant-Sealed NORDSTROM VALVES

Nordstrom valves have a built-in lubricating system. The lubricant does two important things—it keeps the plug easy to turn so the valve shuts and opens in an instant when it is supposed to; it seals against the small leaks that become big and expensive and perhaps dangerous.
That's why Nordstrom valves

ARE YOUR BEST BUY

Rockwell Manufacturing Company, Pittsburgh 8, Pa.

Nordstrom Valves Another Quality **ROCKWELL** Product



NATURAL GAS

Underground Storage Project Planned by Hope Natural

WASHINGTON.—Hope Natural Gas Co., Clarksburg, W. Va., has received Federal Power Commission permission to develop an underground natural-gas storage pool in Kennedy field of Lewis and Harrison counties, West Virginia.

The company plans to carry out the project by laying 19 miles of pipe line, reconditioning 46 of the existing wells, and redrilling 15 abandoned wells. When completed, the reservoir will have a capacity of about 20,000,000,000 cu. ft., of which half will be active.

The development is expected to cost approximately $1,236,000.

FPC Says Revenue in May Up 28.7 Per Cent from 1952

WASHINGTON. — Operating revenue of natural-gas companies totaled $181,050,495 in May, an increase of 28.7 per cent increase over the same month last year, the Federal Power Commission reports.

Revenues for the 12 months ending May 31 totaled $2,130,328,163, or 20.2 per cent higher than the last corresponding 12-month period.

Gas sales to ultimate consumers were 223,546,000,000 cu. ft., an increase of 18.9 per cent. Residential, commercial, and industrial sales went up 17.9 per cent, 22.3 per cent, and 19.1 per cent, respectively, with revenues from these three classes of service registering increases of 23.1 per cent, 29.6 per cent, and 27.8 per cent, respectively. Revenues from all sales to ultimate consumers increased 25.7 per cent, totaling $80,429,868.

The net incomes amounted to $19,137,869, up 37.9 per cent over May 1952. Net income for the year was $220,414,583, a 8.2 per cent increase over the 12 months ending May 31, 1952.

Firm Seeks Gas Supply

WASHINGTON. — The Federal Power Commission will conduct a hearing here August 24 on an application by Kansas-Colorado Utilities, Inc., Lamar, Colo., requesting that Colorado Interstate Gas Co. be directed to supply the firm with 5,000,000 cu. ft. of gas from May to November each year at rate of 12.5 cents per thousand cubic feet.

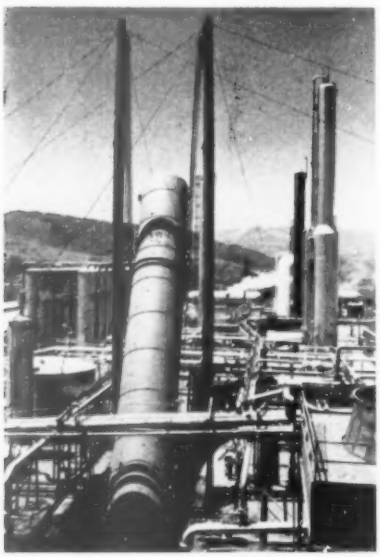
In answering the application, Colorado Interstate officials stated the company would not object to supplying the gas, but contests the commission's authority to fix the rate at which the gas would be sold.

W. J. Grove Gets FPC Post

WASHINGTON.—William J. Grove, Camp Hill, Pa., is scheduled to assume duties today as assistant general counsel in charge of natural-gas matters for the Federal Power Commission succeeding Bernard A. Foster, Jr., who retired recently.

At the time of his appointment he was assistant chief counsel of the Pennsylvania Public Utility Commission. Between 1943 and 1949 he served as law clerk to Associate Justice Patterson of the Pennsylvania Supreme Court and for several months served in the same capacity for Associate Justice Chidley.

The 39-year-old Pennsylvanian received his A.B. degree from Ursinus College and his LL.B. from Temple University.



Expansion Nears Completion

A $1,000,000 expansion program at Shell Oil Co.'s natural-gasoline plant in Ventura Avenue field is expected to be completed by September 1. Upon completion by Flour Corp., Ltd., the plant's present capacity of 200,000 gal. daily will be increased one-third. Here an 86-ft. column is being raised into position.

NATURAL GASOLINE

Continental to Increase Capacity of Gillis Plant

LAKE CHARLES, La.—Continental Oil Co. plans to increase the processing capacity of its Gillis natural-gasoline plant near here from 27,000,000 cu. ft. to 90,000,000 cu. ft. of gas daily.

The company will build new facilities at the plant which will produce a mixed stream of propane, butane, and natural gasoline. This will be transported to the firm's refinery here for separation and marketing. Presently, the plant's output is largely butane and natural gasoline.

The $1,500,000 construction project, which has been awarded to Hudson Engineering Corp., Houston, will get under way in September and is expected to be completed in early 1954.

Conoco Plans 2,000,000-Gal. Underground-Storage Project

HOUSTON.—Plans for a 2,000,000-gal. underground-storage project by Continental Oil Co. near Big Lake in Reagan County, Texas were disclosed here last week.

The company will store excess propane or butane produced at its 50,000-gal. Todd Ranch gasoline plant 27 miles south of Big Lake in a cavity washed out of a salt section about 1,000 ft. Products from the plant are piped to the Big Lake terminal where the reservoir will augment the company's eight 600,000-gal. tanks.

Brine would be pumped into the Yates sand through an injection well to be drilled nearby to approximately 1,400 ft.

Two Texas Gas Corp. Plants To Get Refrigeration Units

HOUSTON.—An $800,000 contract for a new refrigeration plant in connection with two large natural-gasoline plants at Winnie, Tex., has been awarded to Gasoline Plant Construction Corp. here.

The announcement was made by Russell M. Riggins, president of Texas Gas Corp. The 1,500-ton refrigeration plant is to become a unit of the gasoline plants, which are now processing about 175,000,000 cu. ft. of gas daily.

The entire plant system is handling more than 200,000,000 cu. ft. of gas daily.

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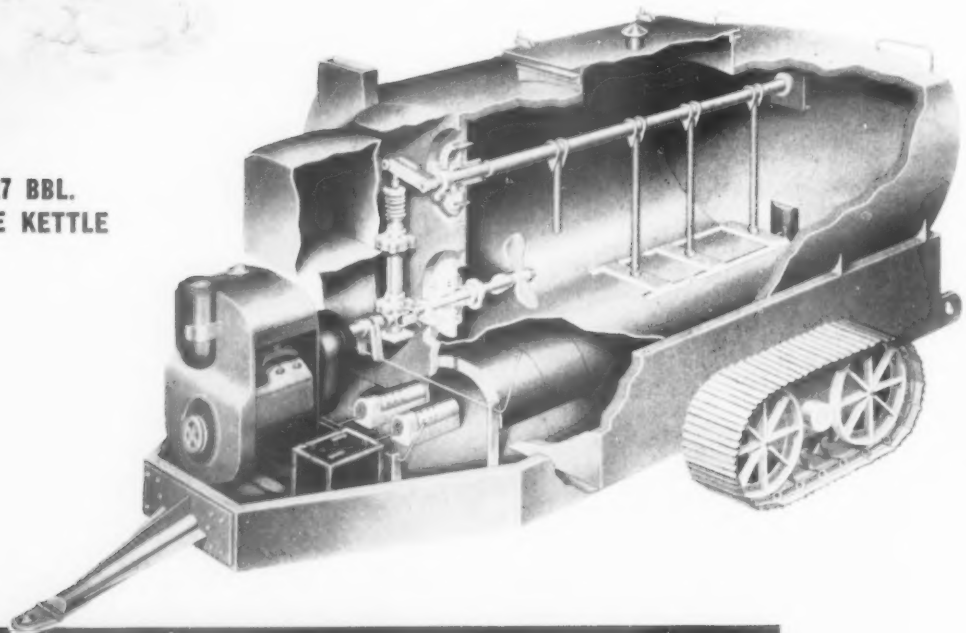

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PIPE LINES

Triangle Plans to Build 560-Mile Products Line

SHREVEPORT.—Triangle Pipe Line Co. is conducting negotiations for construction of a 560-mile products line from Arkansas City, Ark., to Covington, Ky. The main trunks line diameter would be 14-in.

The proposed line would have a capacity of 90,000 bbl. daily and would serve terminal points at Corinth, Miss., Nashville, Tenn., Frankfort, and Covington, Ky. The line would be an extension of the company's existing products system from Carthage, Tex., via Shreveport and El Dorado, Ark., to Arkansas City.

The company is not ready to indicate when the project might be built, said V. B. Chance, president. However, the Office of Defense Mobilization in Washington issued a certificate of necessity for quick write-off of the proposed $24,494,900 line. It allows a 40 per cent quick write-off on $4,988,300 and 25 per cent on $19,504,600. The quick write-off applies to cost of extension of the line, right-of-way, and storage facilities.

According to the application for accelerated amortization, the line would cost $18,700,000, the right-of-way $700,000, and storage facilities for 2,000,000 bbl., $5,000,000.

Price Completes 363-Mile, 26-In. Line for Texas Gas

BARTLESVILLE, Okla.—H. C. Price Co. has announced here the completion of 363 miles of 26-in. loop lines from Greenville, Miss., to Owensboro, Ky., for Texas Gas Transmission Corp.

The project was part of a $33,753,000 expansion program being carried out by Texas Gas. Construction began over a year ago and was finished August 1.

Also, Price announced the recent completion of a 74-mile, 24-in. gas line in western Pennsylvania for Tennessee Gas Transmission Corp. The line is located near the famous Drake Well and connects T.G.T.'s main line with an underground storage area at Cowdersport, Pa.

Houston-Port Arthur Products Line Completed by Sinclair

HOUSTON.—Sinclair Pipe Line Co. has completed a 12-in., 83-mile products line from Houston to Port Arthur, Tex.

The new line will transport 54,000 bbl. daily into the Evangeline System now under construction from Port Arthur to Baton Rouge. There the 183-mile system will connect with the existing Plantation pipe line providing uninterrupted products movement from Houston through five states to Greensboro, N. C.

Sinclair Pipe Line is a part owner of the Evangeline System.

Kansas-Nebraska Plans Gas-Line Construction

WASHINGTON.—Kansas-Nebraska Natural Gas Co., Inc., Phillipsburg, Kans., is seeking Federal Power Commission authority to lay 41 miles of line on its natural-gas transmisison system in Kansas and Nebraska.

The proposed project would replace existing lines previously authorized by the FPC. Also, the company plans to install additional cooler and scrubber facilities at existing compressor stations, and to build a new station. Combined cost is estimated at $922,410.

The company asked that the new

Aid to Better Operations

Warning signs is one method H. C. Price Co. uses to combat damages to private property on construction jobs. Jimmy Trentham, company safety engineer, points to one type which was used along Texas Gas Transmission Corp.'s 363-mile pipe-line project from Greenville, Miss., to Owensboro, Ky.

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application replace a previous authorization for construction of 98 miles of pipe line in Kansas.

Price Uses Engraved Map To Show Construction

BARTLESVILLE, Okla.—A 54 by 80-in. engraved plastic map is being used by H. C. Price Co. to reflect its accumulated record of some 22,000 miles of pipe-line construction throughout the nation.

Trimmed in neon tubes, colored lines on the black-face plastic indicate various construction work undertaken by the company. Presently, Price is taking part in construction of a 860-mile line from southern Louisiana to eastern Kentucky.

Interstate Gets Write-Off

WASHINGTON. — The Office of Defense Mobilization here has issued Interstate Oil Pipe Line Co., Shreveport, a certificate of necessity for a quick tax write-off of $2,804,300 for construction of storage and transportation facilities from Shreveport to Anchorage, La.

The company was allowed 40 per cent write-off on $600,000; 25 per cent on $48,700; 15 per cent on $1,000,000; and 10 per cent on $1,155,600.

Also, the ODM issued Plaquemine Towing Corp., Plaquemine, La., a certificate for quick write-off of 60 per cent on $250,000 for towing and transportation equipment.

Ohio Fuel Begins Line

COLUMBUS.—Ohio Fuel Gas Co. has started construction on a 16-in. natural-gas line in the Arlington-Grandview area to increase gas deliveries in suburban sectors.

In addition, the company plans a 6-in. line for new consumers in Springfield's subdivisions.

Lone Star Plans Gas Line

DALLAS.—Lone Star Gas Co. plans to lay a 36-mile, 12-in. line from Stamford, Tex., to its transmission network near Abilene, Tex., company officials announced here recently.

The line, which will cost over $838,000, will have a maximum capacity of 30,000,000 cu. ft. daily. Gas supplies will come from producing areas in Scurry and Runnels counties, Texas, and from an underground-storage project near Abilene. Construction is expected to start within 60 days.

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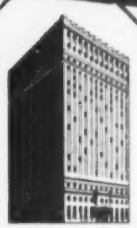

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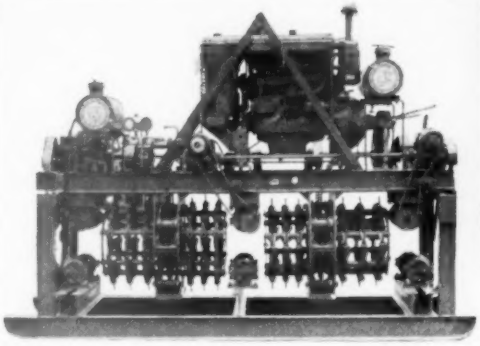

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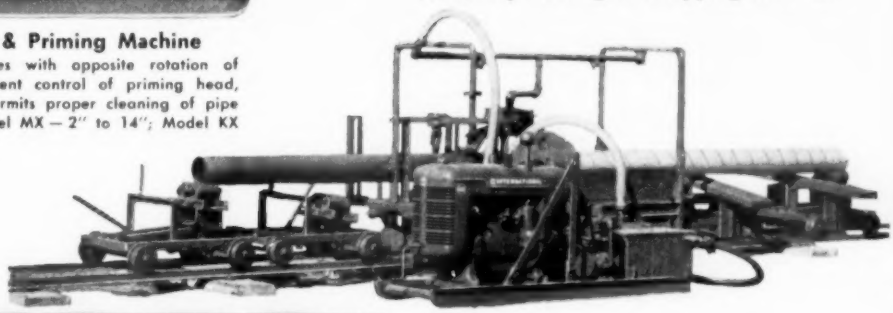

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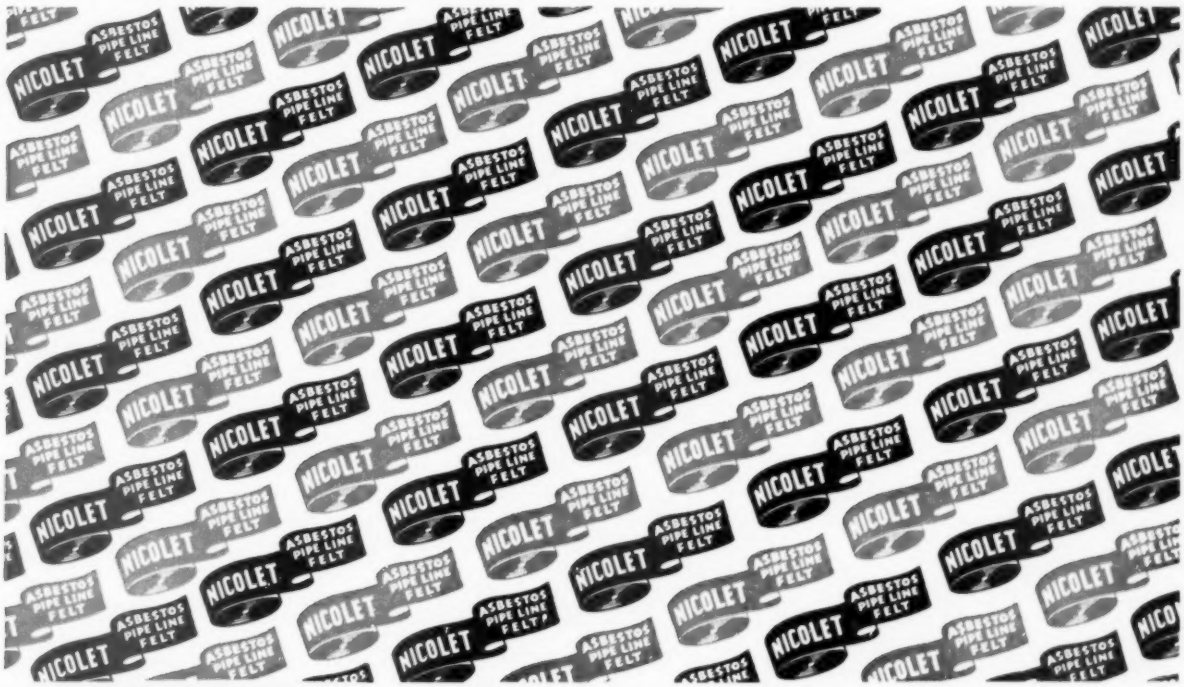

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REFINING

Eastern States to Expand Alkylation Facilities

HOUSTON.—Eastern States Petroleum Co., Inc., plans to get under way soon on its long-delayed program of expanding and improving alkylation facilities for increased production of aviation gasoline at its 50,000-bbl. refinery here.

Twice before the company has changed its plans. Present plans call for installation of a sulfuric acid process necessitating changes in reactors and catalysts. Work on the project will begin as soon as a $2,100,000 loan is obtained from the Reconstruction Finance Corporation, according to company officials.

The alkylation plant was originally owned by the Government and run by Eastern States during World War II. The company leased it for a time after the war and in 1947 bought it.

Catalyst Still Efficient After Operating 1 Year

MARCUS HOOK, Pa.—An oxidizing catalyst converting waste gases into steam and electricity at the Sun Oil Co.'s refinery here has been found to be as efficient as when it was installed over a year ago.

After the catalyst, a development of Eugene J. Houdry, catalytic scientist of Ardmore, Pa., was on stream for more than 8,500 hours in one of the refinery's cracking units, two of the 2,500 catalytic units were withdrawn and tested.

Each eliminated 99.2 per cent of the combustible materials in the waste gases—exactly the same percentage as in June 1952 when the catalytic bed was installed.

The catalyst operates under severe conditions in the refinery since the waste gases contain dust, tarry materials, hydrocarbons, sulfur, and carbon monoxide. Furthermore, temperature of the catalyst jumps from 800° to 1,300° F. and back again every 10 minutes.

These results at the end of a year of operation indicate that no replacements will be needed for the catalytic units. Standby units stored here have been removed.

The individual catalytic unit measures 5½ in. long, 3⅛ in. high, and 3 in. wide. A tiny bird cage in shape, it is made up of two thick porcelain end plates and, between them, a porcelain spacer bar and 73 coated porcelain rods.

Gases flow across the rods, each tear drop in cross-section so as not to disturb the flow. The combustion occurs at the surface of the rods where they are coated with a .003 in. film of the catalytic agent—catalytic alumina and platinum alloy.

No Excise Tax on Reclaimed Oil Says Internal Revenue

WASHINGTON.—The Bureau of Internal Revenue is still maintaining its position of not imposing a manufacturers' excise tax on reclaimed lubricating oil, the National Petroleum Association reports.

In seeking a "definite statement of its position" from the bureau, the NPA recently held a conference with the bureau's chief counsel. Despite the fact that some reclaimers claim that they perform a complete manufacturing operation, NPA reports that the bureau has concluded that its present position should stand, "in view of the long-standing present position of the bureau to the effect that mere cleaning or re-refining used or waste lubricating oil is not a manufacturing process, and the fact that there have been at least three unsuccessful attempts to legislate an excise tax on reclaimed oil."

In its efforts to obtain a definite statement of position from the bureau, NPA is supported by the National Oil Jobbers Council.

Petrochemicals

Celanese Plans Expansion of Product Development Work

NEWARK.—The Application Laboratory of the Chemical Division, Celanese Corp. of America, is being transferred from Newark to Summit, N. J., where product development work will be expanded.

Part of the expansion will include intensified study toward the application of tricresyl phosphate as a gasoline additive. Such a gasoline containing this additive is being marketed by Shell Oil Co. Shell reports that tests have proven TCP to be an important step in combating preignition and other combustion difficulties encountered in high-combustion engines *(The Oil and Gas Journal, July 20, page 166)*.

Other recent Celanese chemicals to

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receive added attention will be such petrochemicals as vinyl acetate, pentaerythritol, paraformaldehyde, vinyl plasticizers, and lacquer.

The laboratory operates as a function of the Product Development Department and assists in development of new products through technical service.

Lack of Feed Stock Causes Stanolind to Close Plant

BROWNSVILLE, Tex. — Stanolind Oil & Gas Co. will close down its chemical-plant operations here this week because the plant has used up its stock of raw materials from the big Carthage Hydrocol plant, which closed 2 months ago for extensive remodeling and refinancing.

The Carthage Hydrocol plant produced synthetic gasoline and a mixed chemical coproduct from natural gas. Stanolind took the coproduct stream, separated and refined the chemicals, and then sold the bulk products to United States Industrial Chemicals, Inc., which still operates its plant. However, this plant is expected to be closed also as soon as its feed stock is depleted.

The Stanolind plant has a production capacity of 125,000,000 lb. of chemicals a year. Its main products are alcohols, aldehydes, acids, and ketones which are used in manufacture of pharmaceuticals, plastics, insecticides, lacquers, and related products.

Guy Gabrielson, former Republican national chairman and president of Carthage Hydrocol, announced in New York recently that the plant would be reopened as soon as needed repairs are made *(The Oil and Gas Journal, July 6, page 120)*.

L. L. Smith, plant superintendent for Stanolind, said his firm will retain most of the 104 Brownsville employes on the payroll, keeping about 20 to 25 as a caretaker force.

Spencer Building Polyethylene Plant Near Orange, Tex.

ORANGE, Tex. — A 400-acre site near here is being prepared for the construction of Spencer Chemical Co.'s new polyethylene plant.

Actual construction of the multi-million-dollar plant, which will have a daily capacity of approximately 123,318 lb., will get under way in mid-November. The contractor is Quaker Valley Constructors, Inc.

The site, which was dedicated recently, is part of a 3,000-acre tract in the Orange vicinity known as Petrochemical Row. DuPont, Allied Chemical & Dye, and Goodrich-Gulf also own property in the area.

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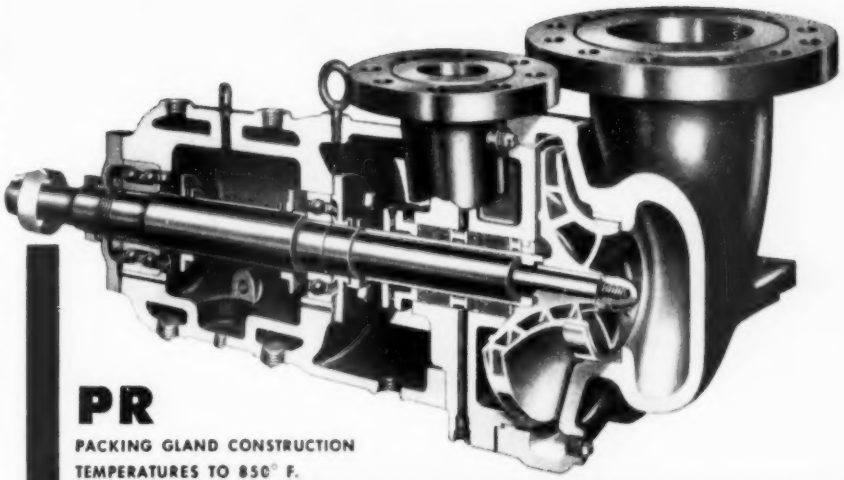

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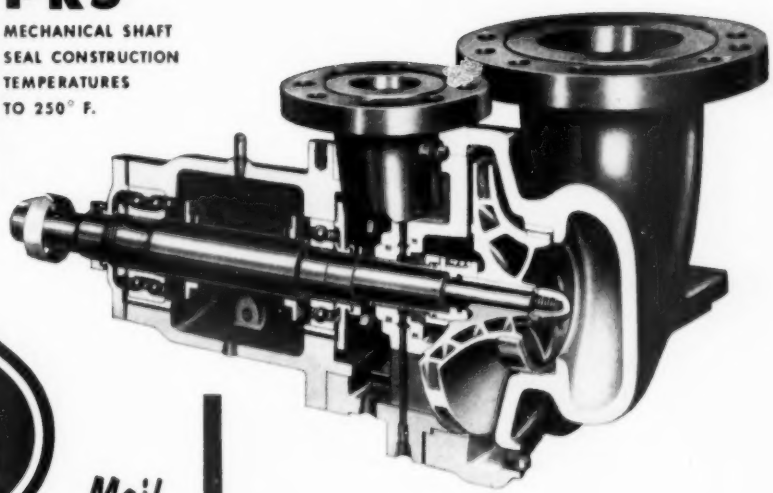

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Among the Drilling Contractors

Longhorn Gets Contracts For Three Deep Wildcats

New contracts taken on by Longhorn Drilling Corp. of Three Rivers, Tex., include one with H. R. Smith of Alice, Tex., for a 10,000-ft. wildcat in San Patricio County, South Texas; another with H. S. Cole, Jr., of Houston, for an 8,600-ft. wildcat in Goliad County, also in South Texas; and another with Seaboard Oil Co. of Delaware for a 7,000-ft. wildcat in LaSalle County, Southwest Texas.

The latter is carried as 1 Nueces Land & Exploration Co. with location in Section 16, H. & GN. RR Survey. The Goliad test, 2 Roosevelt Albrecht, is a Wilcox exploratory venture in the West Weesatches area. The San Patricio test is listed as 1 S. L. Webb.

Field Drilling Co. is drilling on a contract it has with W. Earl Rowe for a 5,500-ft. test located nearly 1½ miles southwest of the latter operator's gas-discovery well, 1 Embleton, of Embleton field, in Jim Wells County, South Texas. This new test is 2-B Embleton.

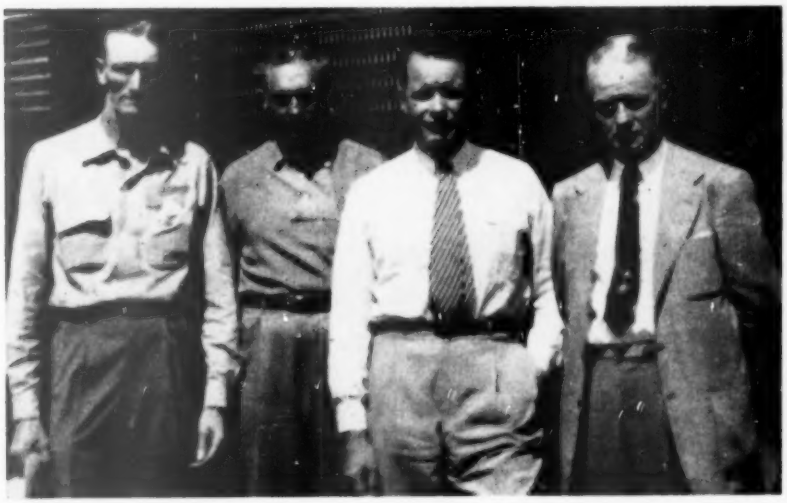
Loffland Brothers Co., Tulsa, will drill another well for Union Oil Co. of California in the Lake Hatch area of Terrebonne Parish, coastal Louisiana. The new operation, 9-B Louisiana Land & Exploration Co., projected to 8,100 ft., is a west offset to the west extension oil well, No. 8-B, recently completed by Union Oil Co. is a 7,900-ft. sand.

Carl U. Perry is drilling for Freeport Sulphur Co. at 1-A Southern Sulphur Corp., a wildcat test on the northeast flank of Section 28 Dome, in St. Martin Parish, coastal Louisiana. The test, located in 28-9s-7e, is projected to 8,000 ft.

San Jose Drilling Co. is starting a 7,000-ft. test for Warren Petroleum Corp. 2½ miles south of Robstown, in Nueces County, lower Gulf Coast of Texas, at 1 Halpert. Location, in Section 17, George H. Paul subdivision of the Driscoll Ranch, is 2 miles southwest of the East Robstown field.

Bayou Drilling Co. has a rig on a wildcat location 2 miles west of the Salem field, in Victoria County, Texas Gulf Coast, where it is drilling under contract for M. H. Stone, of Houston. This test, 2 Karnes, is the second for the operator in the immediate area. The first, listed as "temporarily abandoned," had oil showings in sand at 3,968-78 ft. Contract is for 4,500 ft.

H. L. Rowley, Shreveport, has a contract with La Grange Petroleum



Pete Iske (left end) is drilling superintendent for Vierson-Cochran, Inc., Okmulgee, Okla., one of Oklahoma's most active contracting and operating firms. With him in the field are, left to right: Paul Brown, Bovaird Supply Co.; Joe Young, Mission Manufacturing Co.; and "Bill" Whatley, Jones & Laughlin Steel Corp., supply division. Picture by courtesy, Mission Manufacturing Co., Houston.

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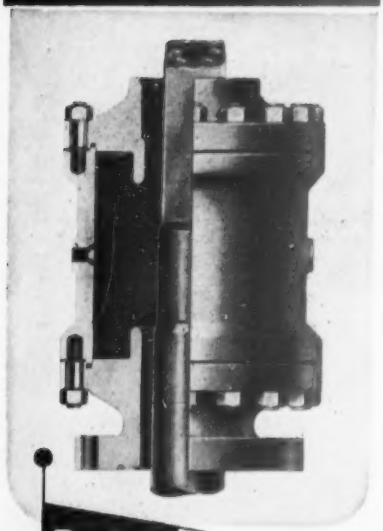

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Corp. for a 9,800-ft. test to be drilled in the Big Island area of Rapides Parish, Central Louisiana. The test, 1 Wilson, is the first to be undertaken in the area in more than a year. It will explore the lower Tuscaloosa section. The area, scene of an active development program prior to 1951, has production from a Wilcox sand around 5,160 ft. and from the Tuscaloosa section around 9,700 ft.

Penrod Drilling Co., Shreveport, is moving a rig to a wildcat location 2 miles south of the Sweetville field, Beauregard Parish, southwestern Louisiana, where it will drill an 8,750-ft. test for H. L. Hunt of Dallas at 1 Long Bell Petroleum Co. Location is in 11-5s-8w.

Vasser & Brown, Natchez, Miss., will do the drilling on a projected 6,500-ft. wildcat test they are starting as joint operators with Billups Brothers, also of Natchez, in the Frogmore area of northern Concordia Parish, eastern Louisiana. Location is for 1 Krauss, in 6-7n-8e.

Johnson Drilling Co., Tyler, Tex., is contractor on a 3,000-ft. Paluxy wildcat test which T. J. Johnson, one of its owners, is starting at 1 Fuller, in the C NE NW 2-13n-13w, 1¾ miles northeast of Holly, in DeSoto Parish, northwestern Louisiana. Location is about 1½ miles southeast of Eagleford production in the Holly field.

J. C. Means, Beaumont, Tex., has a new contract job under way for Sun Oil Co. in Orange County, Texas Gulf Coast. It is a wildcat test, 1 Williams, located 2½ miles west of Mauriceville in the Malcom S. McAlpin Survey. Hole is projected to 8,250 ft.

ACTIVE ROTARY RIGS*

Area—	Week ended 8-3-53	Change week ended 7-27-53	Change week ended 8-4-52
Gulf Coast	577	+12	+ 50
N.&W. Tex.-N. M.	782	— 8	+ 27
Ark.-N. La.-E. Tex.	145	— 2	+ 12
Oklahoma	356	+28	+ 82
Kansas-S. Nebraska	169	+ 2	+ 27
Illinois-Eastern	158	+ 2	+ 8
Rocky Mountains	267	+ 1	+ 32
Pacific Coast	170	— 2	+ 15
Total U. S.	2,624	+33	+253
Western Canada	175	+ 6	+ 10
Total	2,799	+39	+263

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States, Rocky Mountains, and western Canada are shown on pages 191 and 192.

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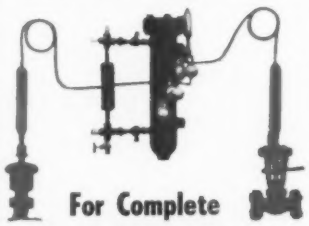

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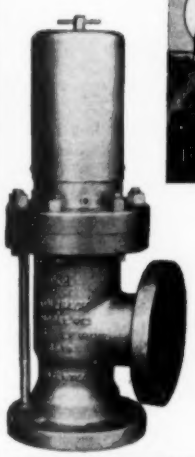

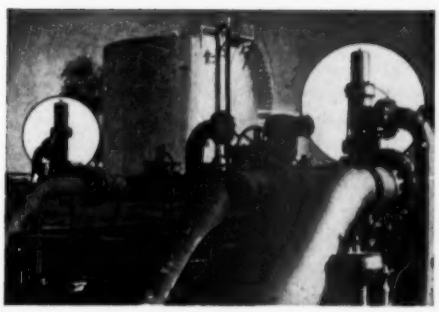

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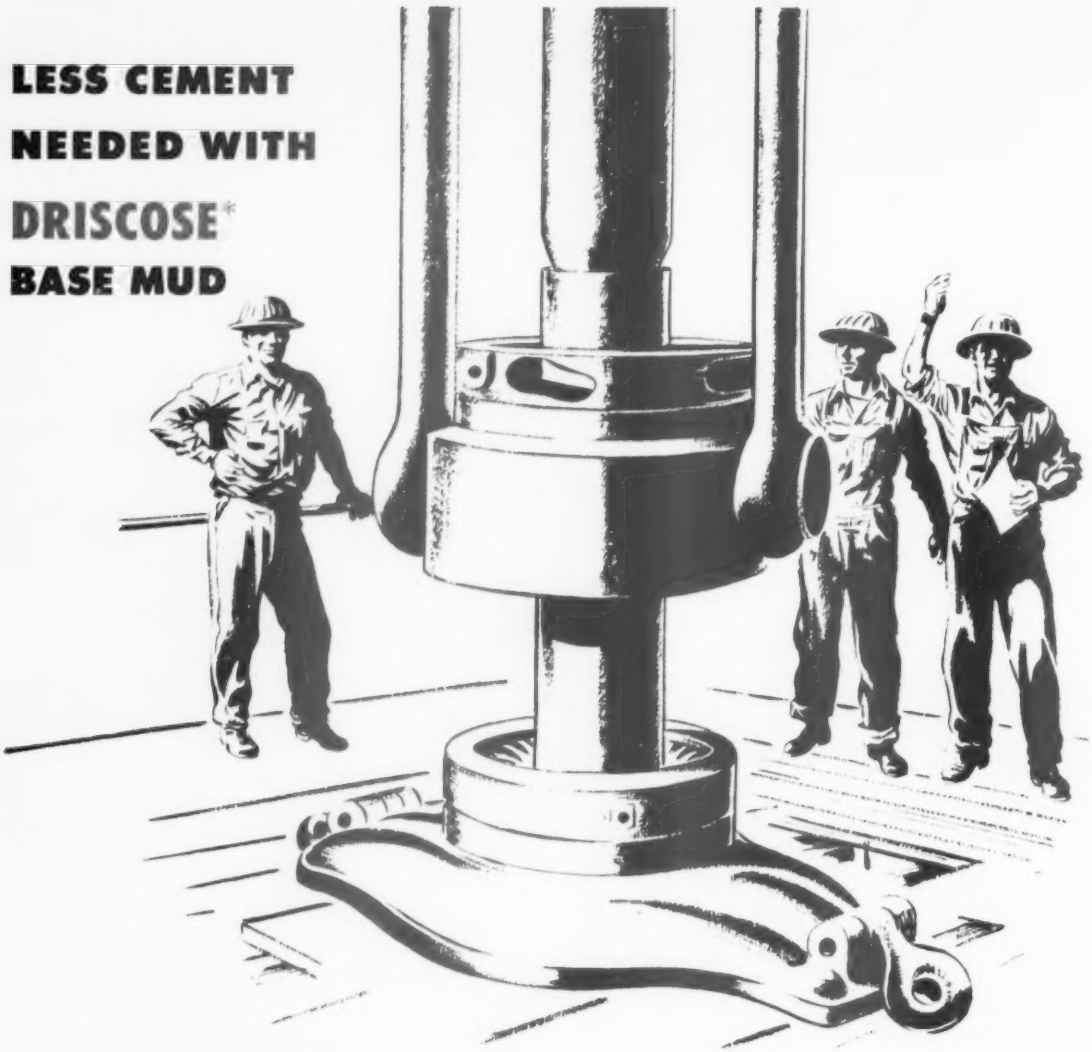

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EXPLORATION

Geologists Will Have a Word For It

by Philip C. Ingalls

WITHIN the next year or so a new comprehensive glossary of geological terms is to be published. It will include many terms appearing in the literature which cannot be found in, or are inadequately or erroneously defined by, existing glossaries or dictionaries.

The compilation of this glossary is being made under the sponsorship of the American Geological Institute. The top echelon of the A.G.I. Glossary Committee is composed of one member from each of the organization's 13 member societies.* This planning group is currently active through working subcommittees composed of specialists in the following subjects of or relating to geology:

Geomorphology, physiography, ore deposits, nonmetallic mineral deposits, mineralogy, petrography, sedimentary petrography, paleontology (invertebrate, vertebrate, and paleobotany), coal and solid fuels, oil and gas and bitumens, reservoir engineering, topographic forms, shore forms, geophysics and seismology, glaciology, permafrost, sedimentation, structure, hydrology, military geology, marine geology, engineering geology, meteorology (phases touching geology), geochemistry, photogeology, tectonics, volcanism, landslides, pedology, petrofabrics, evaporites, and stratigraphy.

All available glossaries of geological terms, published and unpublished, are being collected in Tulsa where they are put on indexed cards. These cards are being sent out to various committee chairmen who turn them over to their specialized committeemen for checking and additions. Overlapping terms which may be claimed by a dozen or so groups are being sent to all so that variant usages will become apparent.

The information developed by the numerous working subcommittees is funneling back to Tulsa where the mechanical work of compilation and final checking is being performed under the direction of J. V. Howell, organizer and temporary chairman of the A.G.I. steering committee.

The Tulsa Geological Society has set up a committee of local specialists to assist in the work of compilation by continuous scanning of material coming in from the working subcommittees and referring questionable terms back to those groups for additional consideration.

The ultimate result of the work now in progress will be a glossary of about 15,000 geological terms. The glossary will contain only seasoned definitions (those published in reputable literature or in common usage) and will not be a vehicle for introducing new and untried terminology. Line drawings will be used when they contribute to clarity. Foreign terms will be included only when no exact English equivalent is available or when it is more commonly used than its English counterpart.

The new glossary will give the earliest known use of each term (some of which go back 150 years), the original definition of that term, changes in usage through the years, the current recommended definition, and alternate definitions, if any.

Contrary to the practice of existing glossaries, the A.G.I. glossary will not be cluttered with nongeologic terms or incomplete lists of generic or specific terms or formational names. The latter are adequately covered by the U.S. Geological Survey's Lexicon of Geologic Names.

This glossary is being prepared by scientists and every term will be reviewed by specialists on the subjects that use that term. It will not include a definition for the Trenton limestone, as that is a formational name, but if the term were included it would not be defined as in the Petroleum Dictionary, to wit: "an oil formation at a depth of about 6,000 ft. in Birdseye, DuBois County, Indiana (1892)". Nor will the glossary use the Petroleum Dictionary's definition of the Ordovician: "the geologic age during which petroleum is believed to have originated."

*Paleontological Society, Mineralogical Society of America, Seismological Society of America, Association of American State Geologists, Society of Exploration Geophysicists, Geological Society of America, Society of Economic Paleontologists and Mineralogists, Society of Vertebrate Paleontology, American Association of Petroleum Geologists, Society of Economic Geologists, American Institute of Mining and Metallurgical Engineers, American Geophysical Union, and Geological Association of Canada.

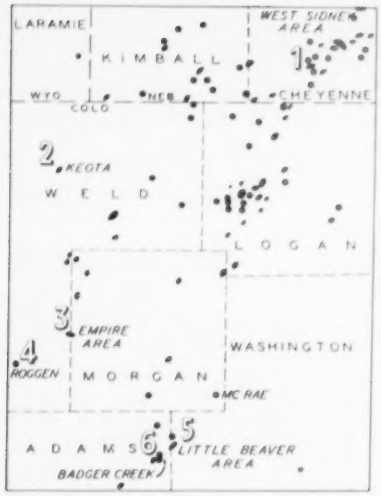
HIGHLIGHTS OF WEEK'S DEVELOPMENTS

COLORADO . . . The California Co. pumped 242 bbl. of oil in 15 hours, and 232 bbl. in another 13-hour test at 1 Baiamonte, SE NE NW 6-7n-66w, Lyons sand discovery in Weld County. Operator is continuing tests.

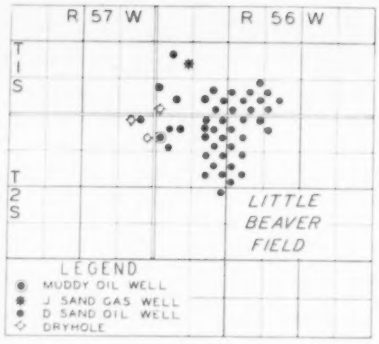
ALBERTA . . . National Petroleum, Northlands Oils, and Regency Oils have a discovery in Del Bonito field in southern Alberta at 1 Deep Test, LSD 8, 7-1-21w4, about 1½ miles north of the U. S. border. The well is being completed in the Banff sand (Lower Mississippian). This is the first well on the Del Bonito anticline to test the Banff sand.

OKLAHOMA . . . Deep Rock Oil Corp. 1 Tom Rowan "A," Lincoln County discovery in SE SE SE 9-15n-4e, is undergoing production tests. The well flowed 189 bbl. of oil per day on 18/64-in. choke from Red Fork sand perforations on the first test at 4,085-95 ft. On second test the well flowed 60 bbl. of oil in 9 hours on 16/64-in. choke. Operations are shut in for more tank room.

NORTH CENTRAL TEXAS . . . American Trading & Production Co. has the first definitely identified Wilberns (Cambrian) pay at 2 Jesse Little in White Flat field, Nolan County. Top of the Wilberns dolomite, in top of the Cambrian, was found at 5,482 ft.



Map of the Denver-Julesburg basin producing areas of northeastern Colorado and southwestern Nebraska showing the areas of the six most significant developments of the first half of 1953.



Map of Little Beaver field in Washington and Adams counties, Colorado, now the third largest field in Colorado. Daily average production in the field is 6,473 bbl., second only to Rangely and Wilson Creek.

Score for first half: Thirty-three oil and gas discoveries . . .

Denver-Julesburg Having Banner Year

by John C. McCaslin

THE Denver-Julesburg basin of northeastern Colorado and western Nebraska, the most active and successful territory in the Rocky Mountains, has recorded 33 oil and gas discoveries this year, breaking all previous half-year records. Five important developments have resulted from this record-breaking number of strikes.

In western Nebraska a major gas area is shaping up at West Sidney in Cheyenne County. A major new producing trend is developing in the Adams - Washington counties area in Colorado, while to the northwest oil production has been established in the area approaching the central and deeper portion of the basin. Pre-Cretaceous oil production, the basin's first commercial recovery, has been established in Keota field, Colorado, and at a wildcat in Weld County, while Greenhorn shallow production has been confirmed in the Empire area.

West Sidney area . . . Ohio Oil Co. has completed the seventh gas well in the general West Sidney gas area. (1 on map). The well is located about 1½ miles south of previous gas production in Cheyenne County, Nebraska. All of the seven gas wells, due to their distance from each other, have been classed as wildcat discoveries. Wells completed in the area have been perforated in the "D" sand, although several have had tests indicating commercial possibilities in the "J" sand. None of the discoveries is rated at less than 5,000 M.c.f. of gas per day. Some tests have ranged as high as 13,000 M.c.f. per day.

The West Sidney gas-producing area is about 5 miles long and 3 miles wide. Although considerable importance has been placed on the development of gas reserves in this area of the basin, no confirmation wells have been drilled, and the wells are shut in pending outlet facilities. Nebraska's other important gas area is to the east in Deuel County.

Little Beaver-Badger Creek area . . . A second major producing trend in the northeastern Colorado portion of the Denver - Julesburg basin southwest of Logan County production is the result of continued development and new discoveries in the Little Beaver and Badger Creek areas of Washington and Adams counties. (5 on map).

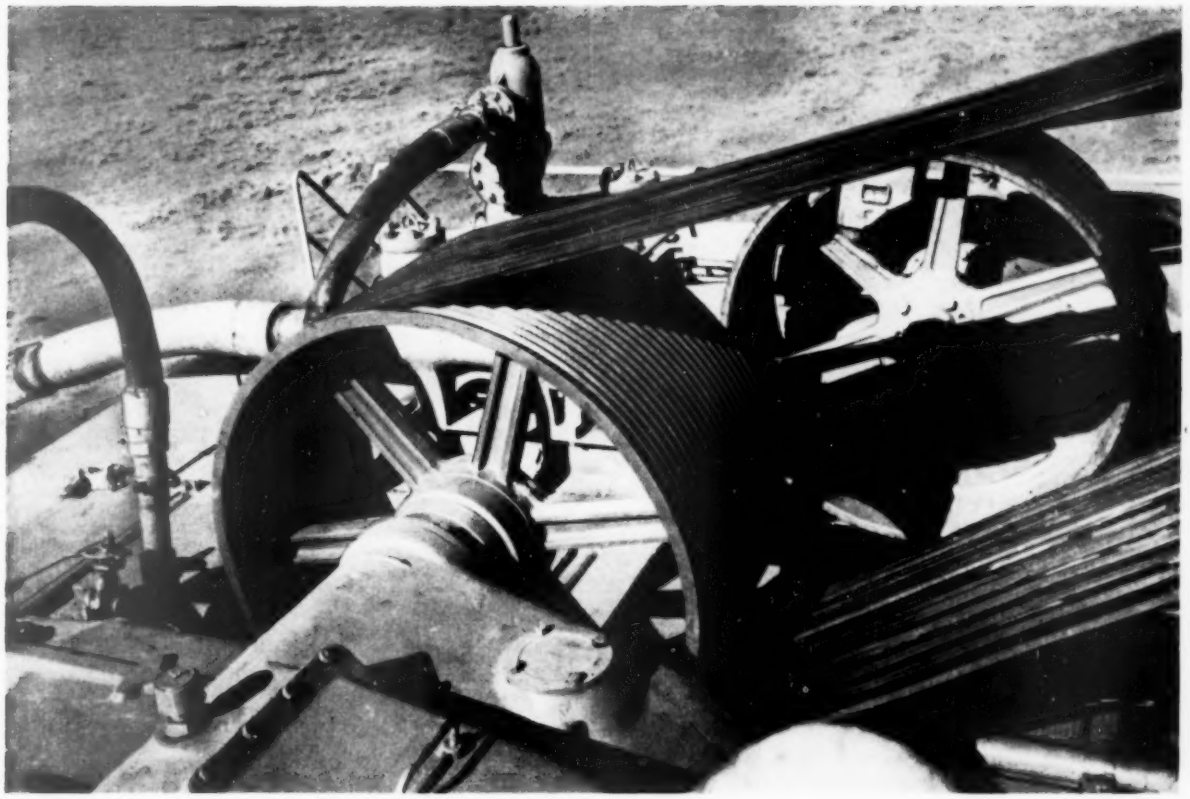
This rapidly developing producing trend extends from Middlemist field in eastern Adams County northeast to McRae field in southeastern Morgan County, Colorado. Focal point of the new trend is Little Beaver field, now the third largest producing field in Colorado. The excellent development of Cretaceous sands has made commonplace the completion of 400-600-bbl. per day producers. The field, which ranks third in proved acreage among northeastern Colorado fields, has a daily average production of 6,473 bbl. of oil, second only to Rangely (65,000 bbl.) and Wilson Creek (7,900 bbl.).

Production in the field, except for the northwest extension which has "J" sand pay, is from the Dakota "D" sand. The wells have thick sections of highley porous, permeable sands. Geologists contend that there are three separate structures in the area, with none of them defined by further drilling. None of the producers in the field have tested water, so the type of drive is in question. One of the best wells in the field has 300 md. permeability and 20 per cent porosity. A "D" sand engineering committee of operators in the field has been established in the interest of gathering data on field operations through bottom-hole-pressure surveys, and for the future objective of self-imposed proration. The field is being developed on a 20-acre pattern.

The latest significant development in the Little Beaver area is Bill Tomberlin's big well 1 mile northeast of previous field production at 1 Hogsett. The well flowed 150 bbl. of oil per hour on test of a 12-ft. "J" sand section. Other recent additions to the field include Forest Oil Co.'s "J" sand gas discovery in the North Little Beaver area. The well was completed flowing 25,000 M.c.f. of gas per day and 110 bbl. of oil, making it the field's largest gas well and new pay.

Forest Oil Co. extended the new trend in Adams and Washington counties 4 miles to the southwest by opening Badger Creek pool (6 on map). The new pool and immediate area have more than a dozen active operations under way. Discovery well at Badger Creek pumped 213 bbl. of oil per day.

The newest pool on the trend is



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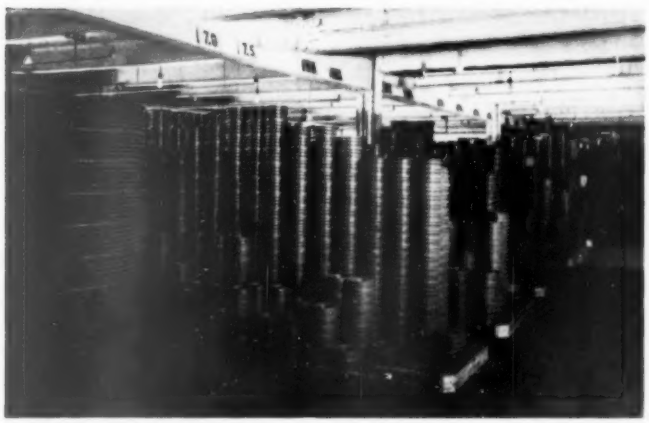

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Sheaves can be headaches.

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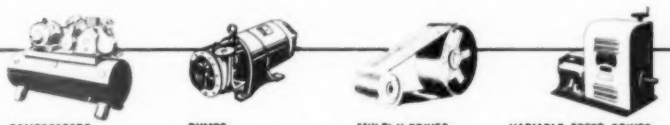

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South Badger Creek, which was opened by Triangle "J" Oil Co., adding 2 miles to the new producing area. The discovery well pumped 240 bbl. of oil per day, and a southeast and northeast offset are tesing at this "D" sand discovery.

Fallon Oil Co.-Windolph 1 Scott, 1 mile southwest of Badger Creek and 1½ miles east of Middlemist pool in eastern Adams County, is being completed as a new discovery after the well made 1,320 ft. of 42°-gravity oil on test of the "J" sand.

At the northeastern end of the new trend Roden, Darden & McRae and Tri-Mark Oil Co. have a successful west offset to new McRae pool in southeastern Morgan County. The well flowed an estimated 60 bbl. of oil per hour on a 1-hour test of the "J" sand. The field is northeast of Little Beaver.

Roggen area . . . Early last winter Twin Oil Co. opened "J" sand production in Weld County's Roggen area (4 on map), moving commercial oil production farther toward the central and deeper portion of the basin. The discovery well was completed for 288 bbl. of oil per day. No important developments in this portion of the basin have taken place since the Roggen discovery, however.

The Roggen discovery is the southwesternmost extension of production in northeastern Colorado. This strike is on the projection of the apparent producing trend extending southwestward from the Goodwin area of eastern Kimball County, Nebraska. Southeastern Weld County, which approaches the deepest portion of the basin, has not attracted much attention until this year.

Permian oil found . . . An important discovery for the future of pre-Cretaceous drilling in the Denver-Julesburg basin was made last spring in Keota field, Weld County, Colorado. (2 on map).

The first pre-Cretaceous commercial production in the basin was established at Sherrod & Apperson 8 Gillette in the Permian-Lyons sand from perforations at 8,466-90 ft. The well was completed on a pump gage of 279 bbl. of oil per day. Production from this discovery has since declined to about 45 bbl. of oil per day and 55 bbl. of water. A confirmation well to the southeast is testing. Deepening projects are under way at Keota field, where several Lyons failures were drilled north, east, and south of the pool.

The California Co. has a second Permian oil discovery indicated at 1 Baiamonte in Weld County, east of Fort Collins field in the west-central part of the county. The operator recovered 7,925 ft. of light green oil on drill-stem test in the Lyo sand at the West Nunn wildcat. The company is testing further. The West Nunn prospect was seismographed by California prior to drilling to the Cretaceous, where the well was suspended until the recent deepening.

These Permian discoveries have revived hopes of deep production in the basin where all previous production has been from the Cretaceous sands.

Another new producing zone in the basin is the shallow Greenhorn of Upper Cretaceous age. Sherrod & Apperson have confirmed Greenhorn production in Morgan County's Empire area. (3 on map). The Greenhorn was previously considered nonproductive in the basin.

KANSAS

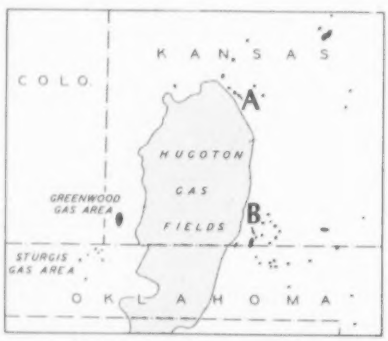
Testing Under Way At Norton Extension

Testing continues at Jones, Shelburne & Farmer 1 Mindrup, SW SW NW 31-3s-23w, indicated extension success to new Norton pool in central Norton County at the extreme northern end of the Central Kansas uplift.

Operators swabbed 2 bbl. of oil per hour natural from open hole at 3,745 to 3,750 ft. in the Arbuckle. A drill-stem test previously recovered 24 ft. of oil and gas-cut mud, 90 ft. of oil and 60 ft. heavily oil-cut mud in 1 hour. The extension well is ½ mile east of Norton pool. Norton pool is located in a rank wildcat area of northern Kansas.

A possible south extension to the pool is Harry Gore Drilling Co.'s 1 Scott, NW NW NE 1-4s-24w, ½ mile south. A drill-stem test in the Arbuckle at 3,805-13 ft. recovered 360 ft. of gas and 420 ft. of oil, open 1 hour.

Jones, Shelburne & Farmer have a wildcat under way 1½ miles southwest of Norton pool at 1 Radloff, NE NE SW 2-4s-24w.



Map of the Hugoton embayment shows Lansekan Oil Co. 1 Wood (B on map), deep Seward County wildcat in the C NE SW 36-34s-32w, 1½ miles northeast of Liberal-Light pool. The deep wildcat recovered good shows of gas, oil, and distillate. A drill-stem test of the Lansing at 5,105-20 ft. flowed light oil in 55 minutes. An earlier test at 5,035-53 ft. recovered 60 ft. heavily oil-cut mud, 370 ft. oil and 1,900 ft. water. A drill-stem test in the Morrow and Chester at 6,050-6,108 ft. gaged 3,654 M.c.f. of gas per day through 1-in. choke and recovered 40 ft. distillate and salt water in 2 hours. At (A on map) W. L. Hartman 1 Finnup, NE NE NW 34-22s-33w, wildcat 1 mile east of Damme South pool in northwestern Finney County, an extension well or new pool is apparent. A drill-stem test at 4,752-83 ft. recovered 2,700 ft. gas, 1,620 ft. clean oil and 180 ft. oil-cut mud.

Kingman Stepout Goes On Pump East of Spivey

Magnolia Petaroleum Co. 1 Marks, C S½ SW NE 23-30s-8w, Kingman County stepout ½ mile east of Spivey pool, is being put on the pump after swabbing 25 bbl. of oil per hour for 10 hours.

A drill-stem test at 4,255-75 ft., open 1 hour, recovered 120 ft. muddy oil, 60 ft. heavily oil-cut mud and 3 ft. water from the Mississippi.

OKLAHOMA

South Offset Slated At Tillman Discovery

S. D. Johnson is preparing to drill a south offset to his recent Tillman County oil discovery in southwestern Oklahoma. The new strike is 1 J. P. Parris, SW SW NW 10-3s-19w. A drill-stem test in the Arbuckle detrital, open 1 hour, recovered 650 ft. of clean high-gravity oil and 60 ft. of mud. The well is reported to be flowing after fracture treatment.

The south offset try will be 2 J. P. Harris, NW NW SW 10-3s-19w.

Production Tests Begin At Cleveland Prospect

Pure Oil Co. is preparing to make production tests at 1 Hobaugh, SE SW SW 30-8n-1w, Cleveland County discovery. Initial tests will be made in the Oil Creek sand, however, the more shallow Tulip Creek has the better prospects. A drill-stem test at 7,878-7,903 ft. and 7,907-24 ft. flowed oil and another test at 7,928-45 ft. in the Tulip Creek recovered 480 ft. of oil.

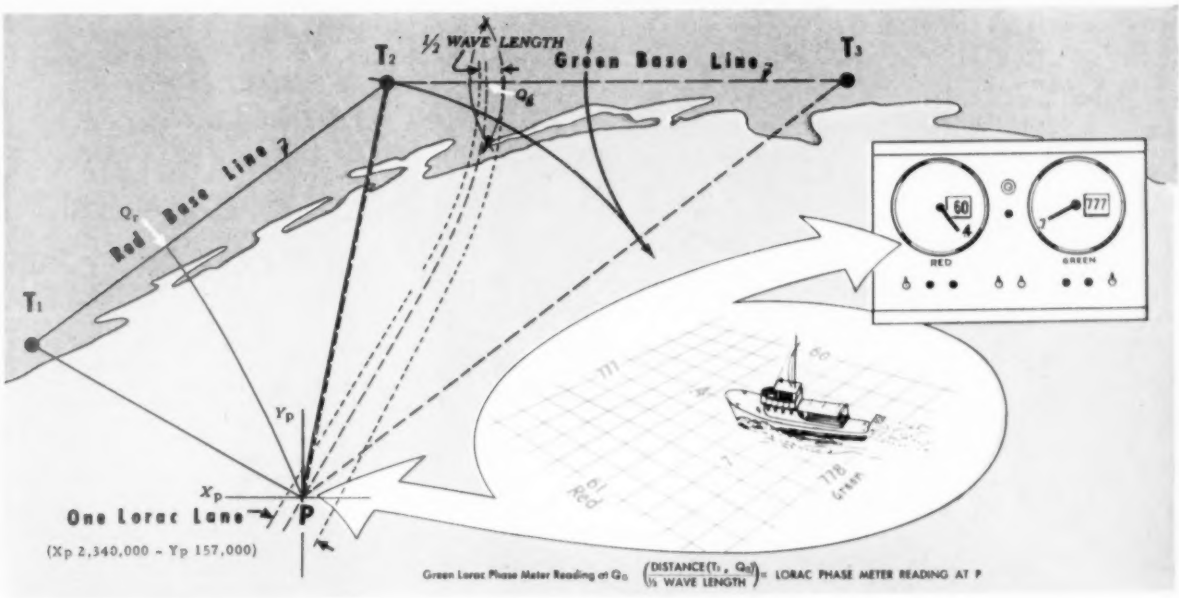
McLish Has Show At Coal Wildcat

Multi-zone pay is indicated at Twin Oil Corp.'s Coal County wildcat in southeastern Oklahoma. The operator ran a drill-stem test at 6,384-6,407 ft., open 2 hours, and the well flowed gas in 6 minutes. Recovery at the 1 Cody, C SW SW 27-2n-9e, was 225 ft. of pipe-line oil, 1,350 ft. of mud-cut oil and 1,905 ft. of salt water. The test is a geological wildcat in Centrahoma pool. The Viola recovered 1,200 ft. of oil-cut mud on drill-stem test.

Bromide Flowing Discovery Completed in McClain Area

Magnolia Petroleum Co. has completed 1 Gladys Love, SW SW 4-5n-2w, 6 miles southwest of Purcell, as a flowing Bromide sand oil discovery.

The well is completing on flow of 325 bbl. of oil per day natural through ¼-in. choke with 145 M.c.f. of gas per day. Gas-oil ratio is 656:1. Gravity of the oil is 40°. Production at the pool opener is from perforations at 8,317-25 and 8,337-77 ft.



POSITIONING WITH LORAC

The Lorac method of establishing position, because it is a hyperbolic system, requires the conversion of co-ordinates from the hyperbolic to the rectangular or vice-versa.

Generally, the positions to be occupied by geophysical operations are known in X and Y values. Converting them to the corresponding Lorac phase-meter readings can be done in three ways.

1) By the use of a hyperbolic grid overlaying the map.

2) By simple geometric construction, or

3) By mathematical computation.

The first two methods, while convenient, provide only approximate equivalents because of the inaccuracies in map making and in the plotting thereon.

For geophysical operation out in the Gulf of Mexico, pin-point accuracy is assured by the use of computing machines which allow full advantage to be taken of the inherent high precision of the Lorac system of positioning.

LISTING OF BOAT POSITIONS IN LAMBERT COORDINATES

BOAT NUMBER	DATE	RED DIAL READING	GREEN DIAL READING	Xp POSITION IN LAMBERT COORDINATES	Yp POSITION IN LAMBERT COORDINATES
1 A	MARCH 13 1953	58.87	780.97	2,340,000	162,000
1 B	MARCH 13 1953	59.40	779.88	2,340,000	160,000
1 C	MARCH 13 1953	59.94	778.79	2,340,000	159,000
1 D	MARCH 13 1953	60.47	777.71	2,340,000	157,000
1 E	MARCH 14 1953	64.84	769.06	2,340,000	145,000
1 F	MARCH 14 1953	44.57	816.37	2,340,000	142,500
1 G	MARCH 14 1953	47.39	810.00	2,340,000	133,500

Example of LORAC position computation.

* Three networks in operation covering an area from off the Coast of Freeport, Texas, to Caillou Bay, Louisiana.

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CANADA

Manitoba Has First 1953 Oil Discovery

Manitoba's first 1953 oil discovery was recorded during the past week, at a wildcat in the Virden area, 8 miles northeast of Daly oil pool at Virden discovered by the California Standard Co. in 1951.

The new southwest Manitoba oil strike was made by McIvor Drilling Co., Ltd., R. W. Development Co., Ltd., Souris Valley Oil Co., Ltd., and associates, at McIvor 1 Roselea, LSD 9, 28-10-26w1, 1 mile west of Virden town and 43 miles west of Brandon.

Like the previous oil strikes in Manitoba, this one was also made in the Mississippian limestone; however, unlike predecessors, this find flowed oil to the surface during drill-stem test. This significant discovery well drill-stem tested from 2,047-2,101 ft., flowed oil in 35 minutes, and when pipe was pulled after the 1-hour test there was no sign of formation water. Gravity of the crude is estimated to be in excess of 28°, and crew is currently running string of production casing.

Golden Prairie . . . Amurex Oil Development Co. has encountered a showing of heavy gravity crude oil in the Jurassic sand at a recently started wildcat in the Golden Prairie area of southwest Saskatchewan.

The oil show came at the company's driller on a farmout tract acquired from Albercan Oil Corp. (subsidiary of Canada Southern Oils, Ltd.). The well, Amurex-Albercan 1 Frank, LSD 4, 3-16-27w3, is 30 miles northwest of Maple Creek and 15 miles east of the Alberta border. The Hulett (J2A) member of the Jurassic sand was contacted at 3,260 ft., and 1-hour drill-stem test was run from 3,254-71 ft. When pipe was pulled it was found to contain 55 ft. of clean heavy gravity oil and 15 ft. of oil-cut mud. Hole was then cored to 3,276 ft. and recovery from that core was 4½ ft. of oil-bleeding sandstone. Testing is being continued, and this well is scheduled to carry through to the Mississippian following full penetration of the Jurassic.

Elk Point - Muriel . . . A 2½ mile natural gas extension has been chalked up by a team of seven Canadian independents at their step-out driller in the Elk Point-Muriel area of central east Alberta, 105 miles east-northeast of Edmonton and 20 miles southeast of St. Paul.

This new gasser, which also gave a small oil showing in mud recovery, was drilled by a four company group, headed by Mill City Petroleums, Ltd., on an approximate 40,000-acre crown reservation, under agreement from Grade Oils, Ltd., Driver Petroleums, Ltd., and Dynamic Petroleums, Ltd. The gas extension well is Mill City 2 Grade, LSD 10, 33-56-6w4, 2½ miles east of Elk Point Natural Gas Co. 3 gas well which was drilled 4 years ago. That latter well rated an open flow of 2,310,000 cu. ft. daily, after perforating in the Cretaceous gas zone.

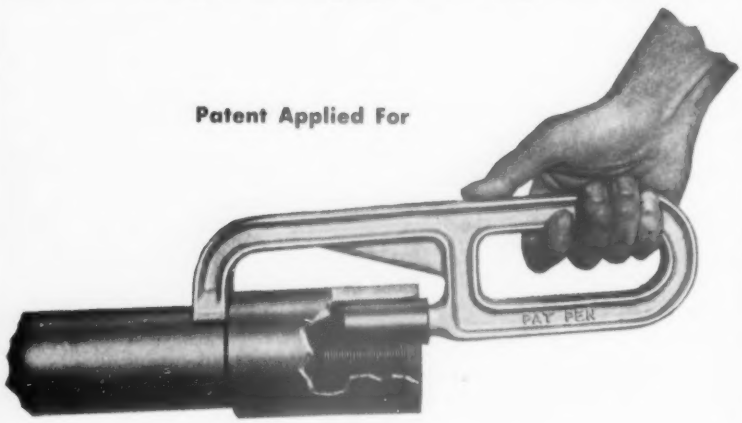
Grade 2 well ran a 45-minute drill-stem test in the first Volony sand interval 1,341-1,451 ft. and received a flow rate of 1,500,000 cut. ft. daily. Pipe recovery was 350 ft. of oil-flecked mud. Crew has run production casing.

Fort St. John area . . . Pacific Petroleums, Ltd., and associates have struck a large natural gas flow at another driller in the Fort St. John area of northeast British Columbia, 1 mile from previous completed gas wells in the area and 2 miles southeast of Fort St. John town.

The new producer, Pacific 23, Fort St. John, LSD 3, 29-83-18w6, is 1 mile due east

Tubing Gripper *by Baird*

Patent Applied For



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of Pacific No. 6 well. Crew ran 115-minute deep sand test in the Permo-Penn interval 6,285-6,308 ft. and received a gas flow in 26 minutes. Maximum flow rate was 10,900,000 cu. ft. daily and recovery was 40 ft. gas-cut mud and 2 ft. naphtha. The gas came in the upper portion of the Permo-Penn, and crew is continuing to core and test through that formation.

EASTERN CANADA

Quebec . . . A recent preliminary investigation of Anticosti Island, in the gulf of St. Lawrence, on which Gaspe Oil Ventures, Ltd., of Montreal holds a concession, indicates that outcropping formations on the north side of the island are Ordovician and on the south side Silurian. Geologists estimate that the Trenton limestone, a petroliferous horizon in Ontario and Ohio, and which outcrops on the shores of Mingan island north of Anticosti, is dipping to the south and will be found in the Anticosti substructure. Further preliminary work will be necessary before actual drilling on Anticosti is undertaken.

In the Gaspe peninsula 2 Bald Mountain is below 5,518 ft. in a hard formation. Continental 1 Deep Test on the Galt Brook Dome is drilling below 3,040 ft. in difficult formation with shows of oil and gas. The 1 Asphalt Base on the same structure, following tests for oil and gas which proved noncommercial, resumed drilling, with hard formation recurring at 1,202 ft.

The 1 Tar Point, standing at 7,069 ft., has slightly increased its oil and gas shows. Quebec Oil 2 is in hard formation below 5,673 ft.

Ontario . . . In Lambton County, Imperial Oil's new test on the Gordon Hollingsworth farm near Watford is below 1,500 ft. Drilling is powered by natural gas from a well 200 ft. south, which ran into a fishing job around 2,200 ft. The first well may later be deepened, and additional deep drilling will be undertaken in the Watford area.

CALIFORNIA

CALIFORNIA

Shell Completes Solano Gas Field Discovery

Shell Oil Co. 1 Unit-B, a wildcat about 3 miles north of Kirby Hills gas field in Solano County, was completed as a new gas discovery. On initial test the field opener flowed at a 5,000 M.c.f. daily rate through a ¾-in. choke. Flow was through perforations at 3,515-55 ft., with hole plugged back from 4,000 to 3,580 ft.

The new discovery is in NW NW 7-4n-1e, approximately 3 miles from the five-well Kirby Hills field discovered by Shell in 1945. This dry-gas field is producing from the Domengine, Eocene, at about 2,300 ft.

Warren to Drill Kern Wildcat

Warren Petroleum Co. has staked location for a wildcat about ½ mile west of Edison production, Kern County. The test, 1 Warren, will be in NW SW 8-30s-29e, approximately ½ mile west of the pool discovered last December by Crown Drilling Co. Production in Crown pool is from the Pyramid Hills sand at about 5,800 ft.

Leffingwell Tests Completed

Northwest and southeast offsets to Hathaway Co.'s new pool discovery in the Leffingwell area of Los Angeles County were completed by Hathaway and Signal Oil & Gas Co. The latter's 1 Signal-Stern was completed as a 100-bbl. pumper in the 8,600-ft. sand, while Hathaway 2 Woodward was completed flowing. Both were in 11-3s-11w.

Hathaway also has recompleted the 1 Woodward discovery, flowing 130 bbl. daily with a 10 per cent cut. The well flowed a similar amount upon completion in the 8,486-8,686 pay last March but in early July went to water.

Guadalupe Development Planned

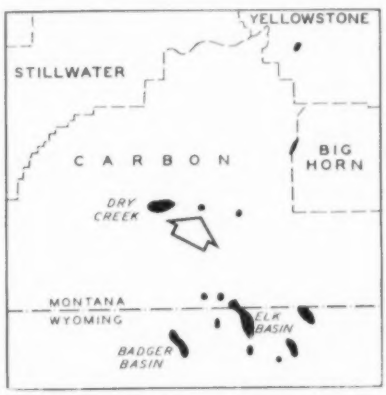
Union Oil Co. has staked four new wells in Guadalupe field, San Luis Obispo County, its first activity since assuming full control of the properties formerly operated by Thornbury Drilling Co. The new locations are in the western portion of the field, approximately ½ mile southwest of G-4 Leroy, which in January was completed in the Knoxville sand to give the field a second pay zone.

ROCKY MOUNTAIN

MONTANA

Important Montana Wildcat Abandoned

Shell Oil Co. has abandoned the 21-15 NPRR, W½ NE NW 15-13n-56e, in the Iron Bluff unit, Dawson County. Total depth was 9,893 ft., with the hole bottomed in Ordovician. No shows of any significance were reported from the well and tests through the normally productive horizons in the Williston basin recovered only small quantities of mud with pinpoints of oil. The dry hole is about 8 miles northeast of Pine field, and almost centrally located on the 12,400-acre Iron Bluff unit.



Carrol J. Kirk has a Dakota discovery (arrowed) indicated on the Golden Dome structure in Carbon County at 1 Stow, NW NW SE 14-7s-22e. Kirk recovered 250 ft. of free 51.8°-gravity oil on test of the Greybull or Dakota at 5,844-5,888 ft. This is the first Dakota test on the Golden Dome structure which is 4 miles east of Dry Creek field where Greybull sands produce 55°-gravity oil.

NORTH DAKOTA

Deep Producer Tested in Beaver Lodge Pool

Test of Amerada Petroleum Corp.'s 2 Kvam, C SW NE 19-156n-95w, in the Beaver Lodge pool has established a possible new pay horizon for the Williston basin. The operator recovered 37 bbl. of oil and 570 ft. of highly gas-cut, slightly oil-cut mud on 4 hour test of the interval 10,442-10,500 ft. Flowing pressure was 1,350-2,900 psi. Top of Jefferson at 10,050 ft. was the last top reported.

The wildcat is important as another discovery in Silurian(?). Silurian-Ordovician oil was recovered from the first well drilled in the field 2 years ago. An earlier test from 10,285-10,341 ft. recovered some oil with the water cushion. The development program in Beaver Lodge and Tioga fields has been confined to the Madison, with only a few exploratory wells drilled below that zone in the proven area. Early shows and apparently commercial production were found in the first wells drilled through the area, but there has been disagreement as to the producing horizons in the early wells. Production has been attributed by different authorities to the Devonian, Silurian and possibly Ordovician.

SOUTH DAKOTA

Shell to Drill Hardin County Wildcat

Shell Oil Co. has made location for a wildcat in Hardin County about 30 miles southeast of Montana Williston basin production. The wildcat is 1-A State, C SW SE 9-21n-4e. Location is on seismic prospect and there has been no previous drilling in the area. The well is about 6½ miles northeast of Carter Oil Co.'s 1-A Hendrik in Hardin County, which is testing at total depth of 8,507 ft. Shell drilled a three well series of wildcats through Perkins and Corson counties in 1951 and 1952 with some shows logged, but no encouragement of possible commercial caliber.

WYOMING

Additional Shows Found at South Sand Draw Wildcat

Sohio Petroleum Co. has reported recovery of a core containing good oil shows from a zone below 8,503 ft. at 1 Unit, SE NW SE 36-32n-95w, in the South Sand Draw unit, Fremont County. The core is believed to be in Phosphia, even though that formation was topped at about 8,181 ft. Details of core recovery have not been released by the operator. The wildcat has already been established as a discovery in Fifth Frontier sand where a test recovered 3 to 5 million cu. ft. of gas per day, and in the Phosphoria zone 8,181-91 ft. where a drill-stem test of that interval recovered between 2,500 and 3,000 ft. of black oil. The recovery was estimated following a blowout during test. The objective in this wildcat is Tensleep which will be tested prior to completion.

COLORADO

Discovery Indicated In Weld County

Harry Royster, Denver, has reported recovery of gas at the rate of a 1,000 M.c.f. together with apparently commercial quantities of oil on drill-stem test of the 1 Porter, NE NE NW 25-5n-61w, Weld County. Test was of the "D" sand interval from 6,466-76 ft., and with tool open 1¾ hours the recovery in pipe was 600 ft. of free oil and 400 ft. of heavily gas cut drilling mud.

The operator is drilling below 6,476 ft. and will test "J" sand. The apparent discovery is about 7 miles south of Greasewood

field, in an area which has had very little previous exploration.

Colorado Permian Discovery Pumps

The California Co. pumped 242 bbl. of oil in 15 hours, and 232 bbl. in 13 hours on two tests of the 1 Baiamonte, SE NE NW 6-7n-66w, in the Black Hollow area of Weld County. Production is from the Permian Lyons sand in the open hole interval 8,916-40 ft. No water was recovered with the oil and the operator is continuing to test. An offset to the discovery is to be located shortly, according to the operator.

UTAH

Last Chance Gas Discovery Reported

Paul B. English and Byrd-Frost reported recovery of gas at the rate of 5,280,000 cu. ft. per day on test of 1 Federal-Rath, C SE SW 18-26s-7e, in the Last Chance area of Emery County. Production was from Moenkopi in the interval 2,550-2,735 ft.

The well is about ½ mile southwest of a very small producer which was drilled in 1934, and produced non-commercial quantities of gas from the same formation. In the previous well the top of the pay zone was found at about 2,724 ft.

APPALACHIAN AREA

OHIO

Considerable leasing activity in the Pennsylvania Grade areas of the state is being encouraged by recent completions. Preston Oil Co. 2 Frank Wyckoff, Section 9, Washington Township, Hocking County, fractured the Clinton, found at 2,630-51 ft., with a resulting 130 bbl. in 24 hours.

An extension of nearly 1 mile to Mount Zion pool, or what may be a separate pool, was found by W. M. Hoey in the 2 C. H. Kidd, Section 6, Fallsbury Township, Licking County. Clinton was logged at 3,053-76 ft., and after fracturing produced 115 bbl. in 24 hours.

An additional well was completed in new Shearer pool on 1 M. P. Selders, second quarter, Bethlehem Township, Coshocton County. Clinton at 3,320-86 ft. was fractured and produced 43 bbl. in 24 hours.

NEW MEXICO

SOUTHEAST NEW MEXICO

Chaves Wildcat Will Try for Completion

Forest Oil Corp. 1 General American-Federal, prospective discovery 8 miles northeast of Lightcap field, has been plugged back from total depth of 9,298 ft. in granite wash to 8,450 ft. Completion will be attempted from a section tentatively identified as Permo-Pennsylvanian. While drilling, the well flowed up to 15 bbl. hourly on drill-stem test from 7,754-7,888 ft., and recovery in the pipe was oil with no water.

This well had the Devonian at 8,867 ft. but drill-stem tests to total depth recovered salt water with no shows.

Anderson Ranch new pay . . . Continental Oil Co. 4 Anderson Ranch Unit, north offset to the field's Devonian discovery, will be completed as a Wolfcamp producer, a section which tested flowing oil in the firm's other three wells.

Flow tests on perforations between 9,760-68, 9,778-9,807 and 9,818-28 ft. gaged 107 bbl. of new oil with no water the first hour and 130 bbl. of oil the second hour through ¾-in. choke.

Delaware discovery testing . . . Richardson & Bass 1 Cobb-Federal, Eddy County deep failure, reported a gage of 410 bbl. of oil plus 35 bbl. of water on a 24-hour test from perforations at 7,003-16 and 7,022-35 ft. Operators are trying for completion from the Delaware Mountain group.

MICHIGAN

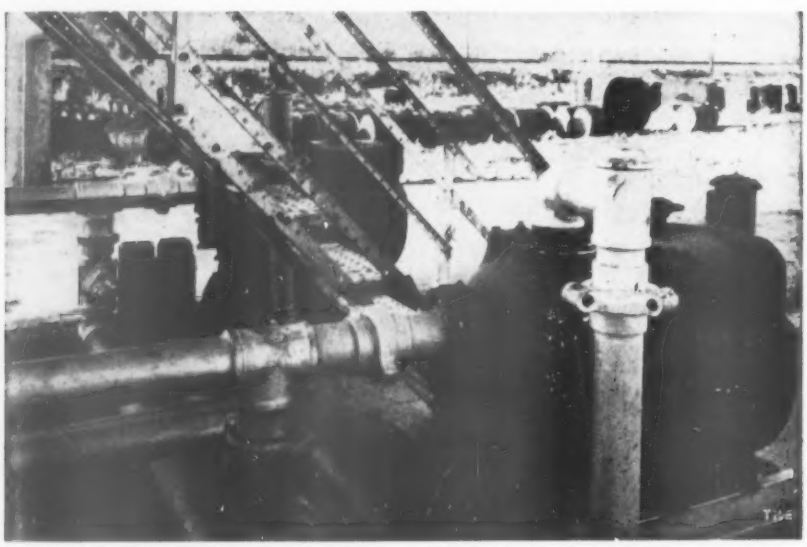
MICHIGAN

A Traverse gas show was reported at Carter Oil Co. 1 Lemcool, SE SW SW 9-25n-10w, Paradise Township wildcat, Grand Traverse, the first of three recently announced Silurian oil and gas tests being drilled by Carter to be started.

The top of the Traverse lime was logged at 1,885 ft. A drill-stem test was run from 1,881-90 ft. for 5½ hours. At the conclusion of the test well was reported to have gaged at 375,000 cu. ft. of gas. Well was being drilled ahead towards the 7,300-ft. Niagaran objective.

The next Siluran test to be spudded by Carter is scheduled to be the 1 Pierce & Fowler, SE SW SE 10-7s-7w, Bethel Township, Branch County, where objective Niagaran should be logged at about 2,500 ft.

It was reported this week that another deeper objective wildcat was ready as soon as drilling contract was let for the NE NE



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CONSTRUCTION MACHINERY COMPANIES
WATERLOO, IOWA

SW 6-4s-5w, Calhoun County. All three of these new Carter deeper horizon wildcats, first concerted wildcatting program by them in Michigan this year, were believed to be in areas where extensive geophysical or core drill work was done previously.

A Traverse objective oil show was reported and under test after being acidized at the Cook Drilling Co. B-4 U. S. A., NE NW NW 28-2n-14w, Valley Township, Allegan County. Well was reported to have logged a possible pay zone at 1,334-36 ft. Top of lime was picked at 1,333 ft. and hole was bottomed out at 1,336 ft. where well carried about a bailer of free oil, with water, natural. Well was acidized with 500 and 1,500 gal. Mechanical difficulties, along with a mudded up pay face, delayed good tests this week.

TEXAS

EAST TEXAS

Red River County's First Oil Production

Seaboard Oil Co. of Delaware 1 Coline, I. Tejeda Survey, 15 miles southeast of Clarksville, had prospects of becoming Red River County's first commercial oil well.

Testing through perforations at 4,920-26 ft. in the Travis Peak formation, operators swabbed 135 bbl. of 27° oil in 24 hours. Following the test it was shut in for pumping equipment. Fluid level during swabbing remained constant around 1,000 ft., according to reports.

Hole was drilled to 7,300 ft. in Smackover limestone, then plugged back to 4,984 ft. Location is 10 miles northeast of Talco and 7½ miles north of the Talxo (Paluxy) field.

Anderson County . . . Jupiter Oil Co. 1 M. E. Jackson-Hodges, Rodessa discovery north of Prairie Lake field, has been completed for 400 bbl. of 45° oil a day through 12/64-in. choke. Pay section was perforated from 8,975-85 ft. Jupiter Oil is said to hold approximately 700 acres around the well and plans to develop the area.

Smith County . . . Humble Oil & Refining Co. 1 Timms, wildcat 8 miles northwest of Kilgore and 3½ miles west of East Texas field, developed gas-cut mud on a drill-stem test at 7,404-7,585 ft.

WEST TEXAS

Northeast Andrews Pool Rates Extension Well

Phillips Petroleum Co. 1-VV University, Ellenburger project southeast of Devonian production in Northeast Andrews pool, Andrews County, flowed 86 bbl. of oil in 1 hour on its first drill-stem test in the Devonian.

The test was run from 12,540-12,605 ft., after topping the Devonian at 12,535 ft. on elevation of 3,033 ft. Oil reached the surface in 43 minutes, testing 43°. Size of choke was not reported. Flowing pressure ranged from 2,610-4,470 psi., and shut-in pressure in 15 minutes was 5,385 psi. Operators circulated out 92 bbl. of oil with no water.

A second test was made from 12,605-12,655 ft. and operators continued drilling below 12,655 ft.

The Texas Co. 1 J. E. Mabee, eastern Andrews County wildcat, developed slight gas shows on its first drill-stem test of the Devonian between 12,237-12,274 ft. Recovery on the test was gas-cut mud. Operators

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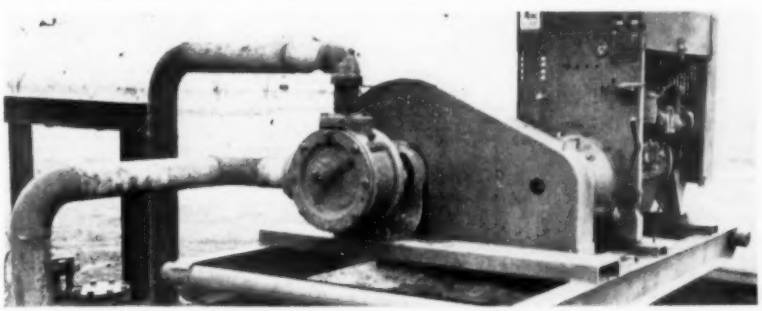

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were drilling ahead below 12,306 ft. Sample top on the Devonian was 12,235 ft., on elevation of 2,985 ft. Location is about 6 miles east of the Hutex Devonian discovery.

Sutton County . . . Ashland Oil & Refining Co. 1 W. D. Wallace Estate, Strawn discovery 17 miles southeast of Sonora, reported a 1,400-ft. reef section. Total pay indicated is around 200 ft., according to Micro-log.

With perforations at 5,006-20 and 6,068-88 ft. packed off, the well flowed 95 bbl. of oil and 100 bbl. of water in 9 hours through 18/64-in. choke from the lower zone. A previous drill-stem test at 6,070-98 ft. flowed at the rate of 25 bbl. hourly, with no water. Testing was to continue in an effort to determine source of the water, then tests were scheduled for the upper section.

Yoakum County . . . A dry hole on the extreme eastern side of the county is to be reentered and drilled from old total depth of 7,920 ft. to 13,000 ft. The new project will be J. C. Barnes 1 Turrentine, SE SE 41-K-PSL. Location is 13 miles east and 3 miles south of Plains, and about 5 miles east of San Andres production in Ownby pool.

WEST CENTRAL TEXAS

Seventh Pay Zone Flows Oil in White Flat Field

American Trading & Production Corp. reported a heavy flow of oil on drill-stem test at its second Cambrian well in the White Flat field of Nolan County, 12 miles northeast of Sweetwater.

American Trading 2 Little in 25-20-T&P is two locations west of 1 Little, original discovery in Hickory sand of Cambrian age. See The Oil and Gas Journal, Fields Section, June 15, 1953. No. 2 Little flowed oil from a new pay section identified as Wilberns dolomite, overlying the Hickory sand.

Top of the Wilberns was 5,482 ft. on derrick floor elevation of 2,004 ft. Top of the Hickory sand was 5,601 ft. A drill-stem test in the dolomite from 5,480-5,522 ft. had gas in 3 minutes and flowing oil in 14 minutes. It made a heavy flow of oil for 1 minute which had to be shut in due to fire hazard. There was no gage nor estimate on the amount of flow, nor was there any water in the testing tool.

The well was drilled ahead, logging further oil-saturated dolomite to 5,601 ft., where it went into Hickory sand, also oil-bearing, giving it an indicated pay section in the Wilberns of 119 ft. The same operators' 1 Little found 198 ft. of oil section in the Hickory sand.

A test in top of the Hickory sand from 5,601-13 ft. had flowing oil, which was not gaged. In drilling ahead, oil-water contact was found at 5,626 ft.

Will be dual completion . . . Plans were to drill ahead until solid granite is reached, then attempt dual completion from the Wilberns and the Strawn, the latter section flowed oil on a test at 5,115-66 ft.

A drill-stem test in Caddo limestonef rom 5,455-82 ft. did not get flowing oil but recovered 450 ft. of clean oil with no water. Operators reported only a thin conglomerate section at the base of the Caddo, going directly into Wilberns dolomite. At last report the well was drilling below 5,811 ft., still in Hickory sand.

Ellenburger discovery . . . Chicago Corp. 1 C. E. Boyd, 63-20-T&P, 5 miles southwest of Trent and southwest of White Flat field, has been completed for a daily flowing potential of 145 bbl. of 46° oil. Top of the Ellen-

burger, and pay, was picked at 5,918 ft. on elevation of 2,383 ft. Total depth was 5,940 ft. and completion was made from the bottom 20 ft.

TEXAS GULF COAST

Yegua Oil Production Opened in Call Area

Warren Petroleum Corp. and R. E. Smith have completed a new oil-discovery well in the Call area of Newton County, where their 1 West Quinn, located in the H&TC Survey, Section 38, flowed 246.54 bbl. of 49.2°-gravity oil per day through 10/64-in. choke from a Yegua sand, opposite which casing is perforated at 7,360-65 ft.

There is a Yegua gas well, Houston Oil Co. 1 Hankamer, ¾ mile east of the new oil producer, but other oil production in the immediate area is from Cockfield sands around 6,900 ft. The area is 4 miles south of the town of Call. Further south, the South Call area produces from Wilcox sands at 10,650 ft.

Discovery at Alta Loma Produces Gas-Distillate

Placid Oil Co. has completed a gas-distillate producer at its 1 Anderson unit wildcat test ¾ mile northeast of the discovery well of the South Alta Loma field, southeast of the town of Alta Loma, in Galveston County.

The discovery well, until now the only producer, is an oil well completed last December in Frio sand at 9,296-9,304 ft. It was drilled by Hassie Hunt Trust as 1 David, and flowed initially 171.12 bbl. of 36.6°-gravity oil per day.

The new well, completed in a deeper sand at 9,917-35 ft., flowed at the rate of 27,500,000 cu. ft. of gas per day on open flow tests. Restricted to 10/64-in. choke, it made 1,974,000 cu. ft. of gas and 68.50 bbl. of 49.5°-gravity distillate per day.

Drilling already is under way at a location, 1 Franke, a half mile to the northeast.

New Oil Pay at Fulshear

Oil production has been established in another sand, the Hillebrandt zone, in Fulshear field, Fort Bend County, with the completion by L. D. French of his 4 Roesner flowing 108.25 bbl. of 46.5°-gravity crude daily through 12/64-in. choke from casing perforations at 6,971-74 ft. Previous completions in this Cockfield pay in this area have yielded only gas. Location is a quarter mile northeast of 1 Roesner, recently completed oil producer for the Clodine sand. The field is productive from various Cockfield and Yegua sands from 6,700 to 7,700 ft.

SOUTHWEST TEXAS

Queen City Discovery Completed in Duval

Queen City sand has yielded another discovery in Duval County, the second within the past month. The new discovery well, drilled by Blanco Oil Co. and others at 14-A J. F. Welder heirs, in the J. Poitevent Survey, 7 miles north of Freer, in the northern part of the county, flowed 34,400,000 cu. ft. of gas per day on open flow tests. The gas carried 18½ bbl. of condensate per million cubic feet. Pay is at 5,874-94 ft., open through casing perforations.

Location is 400 ft. northwest of a Wilcox gas-condensate discovery well, 1-W Welder, recently completed by the same operators.

Late in June, Atlantic Refining Co. opened Queen City oil production in the Hagist Ranch field, on the Duval-McMullen county line. That discovery well, 12 Foster, on the Duval County side of the line, is only 4 miles north of the Blanco gas-condensate discovery well. Its pay is at 5,194-5,212 ft.

Karnes Wildcat Produces

Alaska Steamship Co. and Newman Brothers Drilling Co., joint operators, have completed a new oil-discovery well nearly ¾ mile south of the Porter field, 12 miles south of Runge, in Karnes County. It is their 1 Partmann, in the Victor Blanco Survey, which flowed 45.25 bbl. of 42°-gravity oil per day through 9/64-in. choke with pressure

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at 175 psi. Gas-oil ratio was 412 cu. ft. per barrel. Production is from casing perforations at 4,005-59 ft. Hole was drilled at 7,455 ft.

ARKANSAS

Pumping Tests Due at Miller County Prospect

Tom Palmer and Phil Cochran are preparing to make pump tests at 1 Fouke estate, C SE NE NE 26-17s-28w, indicated Paluxy oil discovery 3¼ miles west of Fouke in Miller County.

The well kicked off and cleaned to pits and flowed 3 to 5 bbl. of oil per hour from perforations at 4,889-93 ft. Later the well died. It is believed the well will flow again under pump agitation. The indicated producer is located on the north wall of the Fouke field graben, it is thought.

LOUISIANA

SOUTH LOUISIANA

New Oil-Producing Field Opened in Allen Parish

A new oil field, located 5 miles northwest of Reeves, in southwestern Allen Parish, has been opened by H. J. Hunt at his 1 Perkins, completed flowing 123 bbl. of 46.7°-gravity oil per day through 8/64-in. choke from casing perforations at 8,923-27 ft. Gas-oil ratio was 1,563 cu. ft. per barrel. The well had been drilled to 10,508 ft. and has casing run to 9,000 ft. Location, in 5-6s-7w, is 4 miles northwest of the Reeves field, nearest production.

Beauregard Parish Gets New Oil-Field Discovery

Curtis Hankamer has completed an oil producer at his 1 Lutcher-Moore, a wildcat located 2 miles east of the South Bancroft field, in southwestern Beauregard Parish. Official gage of production, at completion, was 107 bbl. of 40°-gravity oil in 24 hours with tubing pressure of 1,530 psi. and gas-oil ratio of 700 cu. ft. per barrel. Flow was through 7/64-in. choke from a sand interval at 7,632½-35½ ft. Total depth is 8,600 ft.

Pointe a la Hache Field Extended Mile Southeast

Production of the deep Pointe a la Hache field, in Plaquemines Parish, has been extended more than a mile to the southeast with the completion by Richardson & Bass of their 1-E Humble-Haspel Davis et al Unit B. At completion, the well flowed 150 bbl. of 34°-gravity oil with 161,000 cu. ft. of gas per day through chokes with pressure of 1,600 psi. Casing is perforated at 11,361-66 ft.

NORTH LOUISIANA

Completion Attempt Reported At Tensas Parish Wildcat

Heep Oil Corp., Del Cryer, and F. P. Dayvault have an assured lower Tuscaloosa sand oil discovery at 1 Magnolia-Learned in

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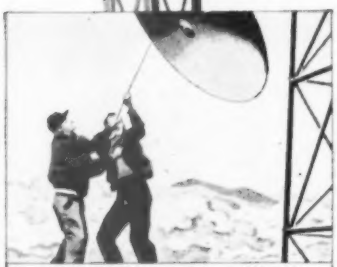

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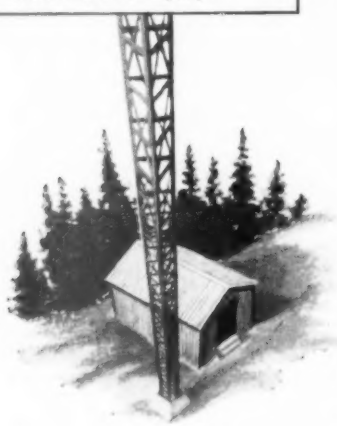

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10n-12e, on Harper's Island in the Rodney Bend of the Mississippi River, Tenas Parish.

Production was indicated on a 27-minute drill-stem test from 9,255 to 9,288 ft. Recovery was 2,050 ft. of 42.5°-gravity oil and 450 ft. of gas-cut mud and drilling fluid with no formation water. Production tests are scheduled.

The indicated discovery is about 5 miles west of Tuscaloosa production in Jefferson County, Mississippi's Rodney field.

Wilcox Test Reported Northeast of Ross Bayou

H. D. Hunt and Associates will drill a 7,000-ft. Wilcox wildcat 2¾ miles northeast of Concordia Parish's Ross Bayou field. One-well Horseshoe Wilcox field lies 2½ miles southeast of the new wildcat.

Elsewhere in Concordia Parish Magnolia Petroleum Co. has staked a north offset to the north extension well of Esperance Point field. Wilcox production will be sought to about 7,000 ft. The drill site lies about 1,250 ft. north of Justiss-Mears and Serio's 3 Hugh Junkin et al in Section 1-5n-9e, which extended the field 1½ miles northwest.

WILDCAT COMPLETIONS

SOUTHWEST TEXAS

Aransas County: Mrs. Mazie Wrather 1 Live Oak, A. L. Bachman Subd., William Carper Sur., A-47. IP 80.04 BOPD, 7/64-in., 44.6°, casing perforations 7,467-71 ft. TD 7,862 ft.) New pay in East Fulton Beach field.)

Atascosa County: Harris S. Stahl 2 Cousins et al, F. M. Mansfield Sur. 6, A-1159. Dry. TD 1,953 ft.

Harris S. Stahl 2 Fujtik, Block 16, Chupick's La Parita Colony Farms Subd., John McNeill Sur. 1190. Dry. TD 1,782 ft.

Harris S. Stahl 3 Fujtik, Block 16, Chupick's La Parita Colony Farms Subd., John McNeill Sur. 1190. Dry. TD 1,740 ft.

Harris S. Stahl 4 Fujtik, Block 16, Chupick's La Parita Colony Farms Subd., John McNeill Sur. 1190. Dry. TD 1,725 ft.

Bastrop County: Robinson Oil & Gas Co. 1 Harris, Isaac Casner Sur. Dry. TD 2,600 ft.

Dimmitt County: Bay City Drilling Co. 2 Crenshaw, Cross S Ranch Subd. (Palms area). Dry. TD 4,460 ft.

Howeth & Mason 1 Zedler, Jose Maria Contis Sur. 250. Dry. TD 4,222 ft.

Duval County: Bridwell Oil Co. 2 Rafael Garcia, Jose Marcelo Ynojosa Grant, A-628. Dry. TD. 6,025 ft.

Morris Cannan and Texita Oil Co. 1 Lopez est., R. Lopez Sur. 6, A-1662 (Richardson field area). Dry. TD 1,870 ft.

Glen A. Martin 1 Gertrudis Canales est., Jose Marcelo Ynojosa Grant, A-628. Dry. TD 5,081 ft.

Frio County: Howeth & Mason 1 Wolfe, A. A. Carpenter Sur. 16. Dry. TD 3,686 ft.

George Parker 1 Berry et al, Matthew C. Patton Sur. 1178. IP 4,100 M.c.f. daily, open flow, open hole 2,975-3,001 ft. TD 3,001 ft. (Extends Big Foot field.)

Guadalupe County: Pat H. Baker et al 2 Baker, Joel Robinson Sur. Dry. TD 2,535 ft.

Hidalgo County: Heep Oil Corp. 1 Crump, Block 8, Porcion 48. Dry. TD 9,000 ft. (approximate).

Jim Hogg County: Rodney Delange and Sam Cunningham 1 Silver Lake Ranches, Sur. 208, A-222. Dry. TD 4,187 ft.

Wymore Oil Co. 1-B Hellen, Duval County School Lands 150. Dry. TD 3,417 ft.

Jim Wells County: H. H. Howell and William F. Morgan 1 Aldolpho Perez, J. Poitevent Sur. 207. Dry. TD 5,693 ft.

Kleberg County: Humble Oil & Refining Co. 1 King Ranch-Alazan, El Alazan Grant. Dry. TD 12,000 ft.

McMullen County: Alaska Steamship Co. and Newman Brothers Drilling Co. 16-B South Texas Syndicate, E. M. Beal Sur. 28, A-589. IP 3,800 M.c.f. daily, open flow, basal Wilcox 6,129-6,230 ft. (open hole). TD 6,230 ft. (New pay in Little Alamo field).

Milam County: Sol Kapel et al 1 Graves, Charles Cronea Sur. Dry. TD 1,605 ft.

Nueces County: George S. Engle 1 Davis, Section 63, George H. Paul Subd. Dry. TD 7,815 ft.

Sid Katz Exploration Co. 1 Wood, Section 15, Benton Pasture Subd. Dry. TD 6,776 ft.

Starr County: C. G. Glasscock 3 Salinas, La Sacatosa Grant, Share 3. Dry. TD 1,902 ft.

Webb County: Harry E. Murray 1 Withers, J. B. Withers Sur. 52. Dry. TD 1,883 ft.

Willacy County: Humble Oil & Refining Co. 7 Sauz Ranch-Nopal, San Juan de Carricitos Grant. IP 3,450 M.c.f. daily, open flow, Frio 7,851-81 ft. (casing perforations). TD 8,210 ft. (Extends Southwest Willamar field).

Wilson County: Lake Rice Mill 1 Mueller, Manuel Ximenez Sur., A-22. IP 127.28 BOPD, ⅛-in., 32.9°, Chalk crevice 2,797-2,855 ft. (open hole). TD 2,855 ft. (New field).

Zapata County: Group Oil Co. 1 Cuellar, GC&SF Sur. 241, Certificate 4-1021. Dry. TD 3,400 ft.

O. W. Killam 12 Bruni est., Block 46, Borregas Grant, Bruni Lands, Killam Subd. Dry. TD 1,918 ft.

Killam & Hurd 5 Bruni est., Share 7, Borrego Grant, Barrocito Pasture. Dry. TD 2,000 ft.

TEXAS GULF COAST

Bee County: Bridwell Oil Co. 2 Baird, J. G. Routree Sur., A-480 (Sliva area). Dry. TD 4,521 ft.

Gaylord H. Chizum et al. 2 Krause, D. C. Bennett Sur., A-34½. (Yougeen area). Dry. TD 4,100 ft.

Producers Corp. of Nevada 1 White, James Nowland Sur., A-241. (Tynan area.) Dry. TD 4,800 ft.

J. B. Bassey 1 Brown, W. G. Kirkham Sur., A-376. Dry. TD 5,220 ft.

Brazoria County: Brazos Oil & Gas Co. 1 Fletcher, John Martin Sur., A-331. IP 28,000 M.c.f. daily, open flow, casing perforations 5,266-70 ft. TD 5,293 ft. (New field.)

Dow Chemical Co. 1 fee, Maurice Henry Sur., A-74. IP 33,000 M.c.f. daily, open flow, casing perforations 7,002-06 ft. TD 7,209 ft. (New field.)

Chambers County: Kirby Petroleum Co. 1 Baily-Vinson heirs, E. H. R. Wallis Sur., A-367. Dry. TD 8,515 ft.

Midstates Oil Corp. 1 Wilcox et al., Charles Wilcox Sur., A-303. Dry. TD 8,790 ft.

Colorado County: Humble Oil & Refining Co. 1 Walker, G. W. Taylor Sur., A-564. IP 16.21 BOPD, ¼-in., 40.9°, casing perforations 6,725½-29½ ft. TD 10,017 ft. (New field—East Shimek.)

De Witt County: Morris Cannan et al. 1 Myra Skinner, Dolores Alderette Lge., A-52. Dry. TD 7,649 ft.

Kirkwood & Co. 1 Drier, Patrick Dowlearn Sur., A-152. IP 7,400 M.c.f. daily and 18 BCPD, open flow, 51°, casing perforations 8,265-90 ft. TD 8,749 ft. (New field.)

Fort Bend County: J. K. Dorrance et al. 1 Foster, William Pettus Sur., A-68. Dry. TD 8,247 ft.

Galveston County: Pan American Production Co. 1 Production Co. Unit A, John Grant Sur., A-72. Dry. TD 10,925 ft. (Completed as salt water disposal well for South Gillock field.)

Goliad County: A. B. Alek 1 Parks, Hall, Crane & Townsend Sur. IP 3,950 M.c.f. daily, open flow, casing perforations 3,532-36 ft. TD 4,481 ft. (Extends, and new pay in Fannin area.)

Dallas Husky and W. Earl Rowe 1 McCord, Noah G. Stebbins Sur., A-256. IP 16,800 M.c.f. daily, open flow, casing perforations 4,733-43 ft. and 4,748-59 ft. TD 4,840 ft. (New pool.)

Grimes County: Woodley Petroleum Co. 1 Stone et al., Henry Hyland Sur., A-259. Dry. TD 8,309 ft.

Harris County: C. J. Brown and Caddo Oil Co., Inc., 1 McKinstry, John Stamps Sur., A-736. Dry. TD 7,930 ft.

Jackon County: Gem Oil Co. 1 Borchers, M. Williams Sur., A-84. Dry. TD 4,509 ft.

Southern Minerals Corp. 1 Kenedy, E. Sisneros Sur. Dry. TD 5,500 ft. (approximate).

Karnes County: Forney & Winn 3 Kunkel, Don Erasmo Seguin Lge., A-10 (Flax area). Dry. TD 4,053 ft.

Liberty County: Austral Oil Exploration Co. 1 Worrall et al., William Harris Sur., A-51. IP 42.63 BOPD, ⅜-in., 38°, casing perforations 8,540-46 ft. TD 8,850 ft. (New field.)

Brazos Oil & Gas Co. 1 Ballard, Moses Donahoe Sur., A-25. Dry. TD 10,250 ft.

John W. Mecom 1 Rolke, E. Munson Sur., A-88. Dry. TD 3,602 ft.

San Jacinto Petroleum Corp. 1 Whitley-Gulf, H. A. Nolan Sur., A-877. IP 107.91 BOPD, 10/64-in., 31.4°, casing perforations 4,438-46 ft. TD 4,812 ft. (New pay in North Dayton field.)

Live Oak County: George S. Hammonds 1 Crawford, R. Everett Sur., A-7. Dry. TD 2,010 ft.

Warren Petroleum Corp. 1 Dove et al., J. Taylor Sur. 132, A-982 (Karon area). Dry. TD 8,800 ft.

Matagorda County: J. M. Flaitz and R. B. Mitchell 1 Pierce Ranch, D. Fenton Sur., A-33 (Armour area). Dry. TD 8,688 ft.

Montgomery County: Sinclair Oil & Gas Co. 2 Bender est., Montgomery County School Land Sur., A-350. IP 3,020 M.c.f. daily, ¼-in., casing perforations 5,797-95 ft. (Yegua). TD 6,198 ft. (New pay in Bender field.)

Newton County: Warren Petroleum Corp. and R. E. Smith 1 Quinn, H&TC Sur. 38, A-1084. IP 246.54 BOPD, 10/64-in., 49.2°, casing perforations 7,360-65 ft. TD 8,154 ft. (New pay in Call field.)

Polk County: Shell Oil Co. 1 Bailey, R. A. Sublett Sur., A-71. IP 16.32 BOPD, 8/64-in., 35.4°, casing perforations 4,953-55 ft. TD 11,496 ft. (Extends Ace field.)

Refugio County: Kirkwood & Co. 1 West, Edmond St. John Sur., A-69. Dry. TD 6,015 ft.

Victoria County: J. H. Hooker and M. H. Stone 1 Karnes et al., IRR Sur. 57, A-222. Shut down. TD 4,641 ft.

Monterey Oil Exploration Co. 1 Frank Beck, Jr., Juan Rene & Sons Sur., A-102. Dry. TD 4,770 ft.

Arnold O. Morgan 1-C Welder, SA&MG Sur. 9, A-320. Dry. TD 9,117 ft.

EAST TEXAS

Anderson County: Mackian Oil Co. 1 Mary

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WILDCAT COMPLETIONS

E. Houston, Phillip Martin Sur. Dry. TD 1,500 ft.

Angelina County: E. L. Kurth 1 Southern Pine, B. J. Thompson Sur. Dry. TD 6,015 ft.

Bowie County: Amerada Petroleum Corp. 1 Dorothy Watts, David Looney Sur. Dry. TD 4,370 ft., elev. 363 ft., Paluxy 4,325 ft.

Harrison County: F. R. Jackson 1 R. L. Sypert, Richard Hooper Sur., A-701. Dry. TD 7,550 ft., elev. 410 ft., Pettit 7,138 ft.

Warren Petroleum Corp. 1 W. S. Monsingo, W. S. Smith Sur., A-637. Dry. TD 7,593 ft.

Navarro County: Stroube-Grelling-Byars 1 Goldbert & Chazanow, Pedro Quero Sur., A-669. Dry. TD 3,500 ft.

Rusk County: La Gloria Corp. 1 Nonnie Strong, G. S. Hyde Sur., A-371. Dry. TD 7,606 ft.

Smith County: Rancho Oil Co. 1 R. L. Perry, Martin V. Lout Sur., A-556. Dry. TD 6,012 ft.

WEST CENTRAL TEXAS

Brown County: James W. Hall 1 Earl Day, Sec. 329, R. M. Ferguson Sur. Dry. TD 2,215 ft.

W. O. Smith 1 Ernest Windham, Sec. 342, Geo. Hancock Sur. Dry. TD 3,792 ft.

Terrell Petroleum Co. et al. 1-A George, Sec. 69, BOH Sur. Dry. TD 3,186 ft.

Coleman County: Gilchrist Drilling Co. 1 Sealy Smith Foundation, 43-2-GH&H. Dry. TD 3,003 ft.

Hisson Drilling Co. 1 Carl Ashmore, Sec. 751, Blk. 12, M. Martinez Sur. Dry. TD 1,605 ft.

O. P. Leonard 1 J. W. Harris, 17-1-GH&H. Dry. TD 1,402 ft.

Coleman County: J. J. Lynn 1 E. C. Coursey, 4-1-H&GN. Dry. TD 3,200 ft.

Miller & Banks 2 Gay Hipsher, Sec. 57, Coleman CSL. Dry. TD 2,322 ft.

Miller & Banks 1 Neff, Blk. 17, D. A. Murdock Sur. Dry. TD 2,388 ft.

Kenneth J. Rich 5 Pettway, Blk. 8, Pleasant Young Sur. 494. IPP 26.5 BOPD, 42°, pay 1,301 ft. TD 1,323 ft.

Sojourner Drilling Co. 1 W. C. Holcomb, 33-2-GH&H. Dry. TD 3,500 ft.

Fisher County: American Liberty Oil Co. et al. 1-A Adrian, T. J. Morgan Sur. 233. Dry. TD 6,207 ft., elev. 2,102 ft., Caddo 6,055 ft.

Lone Star Producing Co. 1 J. S. Criswell, 100-2-H&TC. Dry. TD 7,305 ft.

C. T. McLaughlin 1 Flores, Sec. 312, John Chumley Sur. Dry. TD 5,870 ft.

Jones County: Belcher Trust 1 F. C. Keen, Sec. 49, Deaf Smith Sur. Dry. TD 2,250 ft.

Warren-Bradshaw Exploration Co. 1 Moore, 71-2-SPRR. Dry. TD 3,805 ft.

Shackelford County: Perini-Sandefer 1 Hendrick Ranch, 158-1-ETRR. IPP 12 BOPD, 39°, pay 1,203 ft. TD 1,206 ft.

U. S. Epperson Underwriting Co. 1 Hendricks, Sec. 181, ETRR. Dry. TD 4,916 ft.

Woodson Oil Co. 1 Davis Morton, 33-12-T&P. Dry. TD 5,030 ft., elev. 1,745 ft., Ellenburger 4,921 ft.

Stephens County: Connally-Jackson 1 Alex Fambro, 28-7-T&P. Dry. TD 3,903 ft.

Stonewall County: J. M. Hazelwood 1 M. Belle Morrow, 76-D-H&TC. Dry. TD 6,450 ft.

Taylor County: Carl Tilden 1-E Tom Franks, John McKenzie Sur. 165. Dry. TD 4,939 ft.

Throckmorton County: E. R. Perkins 1 Gorden Brockmon, Sec. 3077, TE&L. Dry. TD 4,367 ft.

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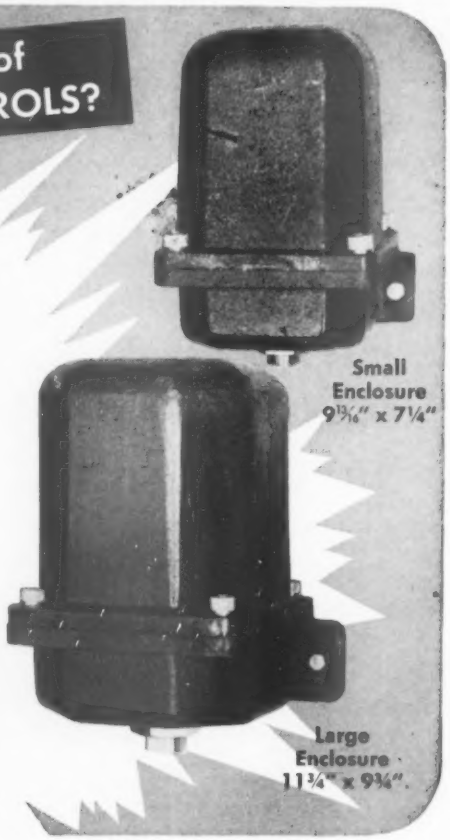

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WILDCAT COMPLETIONS

NORTH TEXAS

Archer County: Luke Grace Drilling Co. 2 W. C. Thomas, Blk. 2, Nathan Thomas Sur., A-454. IPP 52 BOPD, 41°, sand pay 3,702 ft. TD 3,748 ft.

Lowell F. Oil Co. 4-A Duckworth, Blk. 5, Harris subd., Club Ranch, IPP 152 BOPD, 37°, pay 1,386 ft. TD 1,403 ft.

Timberlake & Kelleher 1 Turbeville, Blk. 158, R. Carson Sur., A-92. Dry. TD 1,498 ft.

Baylor County: Felco Oil Co. 1-A Cowan, Blk. 100, T&NO. Dry. TD 2,570 ft.

Felco 1-B Cowan, Blk. 116, T&NO. Dry. TD 2,690 ft.

Clay County: S. D. Johnson 2 Castle, T. Robbins Sur., A-393. Dry. TD 3,050 ft.

Cooke County: J. W. Baldwin 1 B. D. Franklin, E. Ball Sur. Dry. TD 1,781 ft.

F. J. Kirk 1 W. F. Keel, Thos. Mathews Sur., A-710. Dry. TD 1,492 ft.

Grayson County: Howell, Holloway & Howell 2-A Hutchinson, Samuel Stewart Sur., A-1069. IPP 38 BOPD, 36°, pay 2,407 ft. TD 5,097 ft.

Sun Oil Co. 2 G. R. Ferrill, E. C. Smithson Sur. IP 185.8 BOPD, ¾-in., 38°, pay 5,231 ft., elev. 614 ft. TD 5,376 ft. One mile E Big Mineral field.

Superior Oil Co. 1-A E. C. Anderson, J. Bratton Sur., A-131. IPP 61 BOPD, 34°, pay 4,938 ft. TD 6,119 ft. Four miles SW Sadler field.

Jack County: W. C. and C. A. Koons 1 Henderson, G. Thompson Sur., A-613, Dry. TD 403 ft.

Leatherwood Drilling Co. and Barham Bros. 2 John Smith, Blk. 9, Navarro CSL. IPP 65 BOPD, 42°, pay 3,004-09 ft. TD 3,458 ft.

Lebus Brothers 1 J. E. Henderson, T. J. Walden Sur., A-914. Dry. TD 3,044 ft.

Midland Oil Corp. 1 W. A. Beggs, S. H. Tilghman Sur., A2-339. IPP 25 BOPD, 41°, pay sand 2,859 ft. TD 2,886 ft.

Knox County: Humble Oil & Refining Co. 1-D McFaddin, 32-13-H&TC. Dry. TD 6,331 ft.

Montague County: Wayne R. Abbott 1 Abbott-Threadgill, Sec. 10, Jack CSL. IP 240 BOPD, 14/64-in., Bend conglomerate 6,218 ft. TD 6,225 ft.

Fryer & Hanson Drilling Co. 1 G. W. Ayers, T. Scott Sur., A-661. Dry. TD 2,972 ft.

Wichita County: J. N. and J. C. Anthony 1 M. B. Riley Farm, Blk. 88, T. Redman Sur., A-249. Dry. TD 1,812 ft.

C. J. Dick 1 J. E. Roller, W. A. Grady Sur., A-357 IPP 14 BOPD, 40°, pay 276 ft. TD 286 ft.

C. J. Dick 2 Roller, Grady Sur., A-357. IPP 15 BOPD, pay 291 ft. TD 304 ft.

C. C. Pitts 1 Pitts Farm, Blk. 18, Denton CSL. Dry. TD 1,205 ft.

Wilbarger County: Kouri Oil Co. 1-A Innes M. McCrary, 64-14-H&TC. Dry. TD 2,017 ft.

Young County: Clower Flower & Mowery 1 Mrs. E. Ward, A-247, TE&L. Dry. TD 660 ft.

Panhandle Oil Corp. 1-A Annie Leberman, 270-A517-TE&L. Dry. TD 3,700 ft.

WEST TEXAS

Runnels County: AB-Tex Drilling Co. 1 Winters Warehouse Co., D. Floyd Sur. 518. Dry. TD 4,470 ft.

L. H. Armer 1 C. A. Doose, F. Brandes Sur. 396. Dry. TD 5,177 ft., elev. 1,706 ft., Ellenburger 4,940 ft.

Fidelity Oil & Royalty Co. 2 M. H. Vancil, Sec. 27, H&GN. Dry. TD 4,907 ft.

Hovgard & Fitzgerald 1 August McWilliams, Blk. 267, T. J. Hardeman Sur. Dry. TD 4,362 ft.

SOUTHEAST NEW MEXICO

Lea County: Amerada Petroleum Corp. 1 L. W. Ward, 11-13s-38e. IP 1,597 BOPD, ½-in., 44°, Devonian pay 11,725 ft. TD 11,890 ft. Extension to Bronco pool.

Southern Production Co. 1 Cloudcroft, 5-17s-32e. Dry. TD 4,701 ft.

ILLINOIS

Christian County: Goffinit 1 Thothacre, NE NW NW 15-15n-1w. Dry. TD 1,950 ft.

Clark County: T & H Corp. 1 Tatman, NW SW SW 25-10n-13w. Dry. TD 1,790 ft.

Clinton County: E. M. Self 1 Hohmann, NE SW NW 18-1n-1w. Dry. TD 1,451 ft.

Edwards County: Service Drilling Co. 1 Burhans, NE NW NW 8-2s-14w. Dry. TD 3,129 ft.

Hamilton County: G. L. Reasor 1 McFarland, SE SW NW 4-7s-5e. Dry. TD 3,381 ft.

Lawrence County: J. S. Young 1 Busse, NW NE SW 23-4n-12w. Dry. TD 1,961 ft.

F. Lyons 1 Snapp, SE SE NE 31-5n-10w. Dry. TD 2,060 ft.

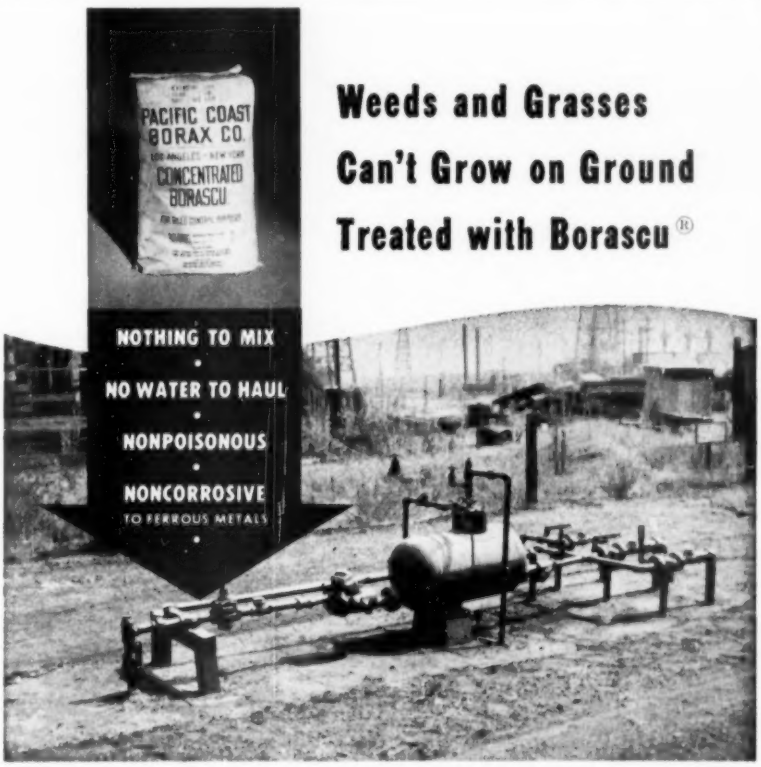
Madison County: H. F. Livermore 1 Kohlenberg, SW SW SE 4-6n-7w. Dry. TD 1,536 ft.

St. Clair County: J. L. Jefferis 1 Schart, NW SE SW 21-1n-9w. Dry. TD 1,216 ft.

Washington County: H. L. Whitaker 1 Frederking, NE NE SE 32-2s-3w. Dry. TD 1,309 ft.

R. Anderson 1 Stedelin, SE SE SW 26-1n-1w. Dry. TD 1,522 ft.

Wayne County: Calvert Drilling Co. 1 Keith, NE NW SE 32-2n-7e. Dry. TD 3,240 ft.



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WILDCAT COMPLETIONS

INDIANA

Knox County: W. F. Catt 1 Letenville, N½ NE NE 32-5n-7w. Dry. TD 1,064 ft. Walter Duncan 1 Hinkle, NE SE NE 8-1n-8w. Dry. TD 1,576 ft.

Posey County: V. T. Drilling Co. 1 Stella Hinsel, NW NE NE 8-4s-12w. Dry. TD 2,020 ft.

Spencer County: Lohman & Johnson, SE SE SW 17-7s-6w. Dry. TD 1,645 ft.
Stanoco 1 C. E. Leslie, NE SE SE 33-6s-6w. Dry. TD 1,594 ft.
E. J. Walters 1 De Wesse, NE NE NE 2-7s-6w. Dry. TD 1,405 ft.

Vigo County: C. Cooksey 1 W. Farmer, SE SE NE 34-11n-10w. Dry. TD 1,261 ft.
H. Adams 1 Truax-Traer Coal Co., NE NE NE 26-12n-8w. Dry. TD 771 ft.
T & H Corp. 1 Bratt, SW NW SE 11-11n-8w. Dry. TD 1,692 ft.

KENTUCKY

Henderson County: White & Vickery 1 Ball, SE NE NW 11-P-26. Dry. TD 1,390 ft.

MICHIGAN

Lake County: Melvin G. Wartell 1 Peiser, C NE SE 6-18n-11w. Dry. TD 3,693 ft. in Dundee and Reed City Zone.

Isabella County: W. B. Stewart 1 Gray, SW NW NW 4-13n-3w. Dry. TD 3,715 ft. in Dundee.

Lenawee County: E. Edwin Brehm 1 Sawyer, S½ SW NW 18-5s-1e. Dry. TD 1,747 ft. in Dundee.

Muskegon County: Milford D. Wells 1 Aney, NE NE NE 35-9n-15w. Dry. TD 1,885 ft. in Traverse.

Oceana County: Admiral Oil Corp. 1 Hornbrook, NE NW SE 24-14n-15w. Dry. TD 2,793 ft. in Dundee.

Ottawa County: Clyde B. Miller 1 Brandwen et al, NE NE SW 23-6n-15w. Dry. TD 1,648 ft. in Traverse.

Van Buren County: W. D. Gannett & Norman L. Stevens 1 Tauber, SE NE SW 8-4s-13w. Dry. TD 1,180 ft.

WEST VIRGINIA

Webster County: Glade district: Dodrill Gas Co. 1 Clara Dodrill, elev. 2,310 ft., 1,917,000 cu. ft. gas, Maxon sand, 1,456 ft., gas 1,463 ft., and 1,489 ft., rock pressure 325 psi. TD 1,518 ft.

MISSISSIPPI

Jefferson County: D. Gammill and Lyle Cashion Co. 1 Straas-Smiley, 68-9n-1e. Dry. TD 6,015 ft. Elev. 213 ft., Sparta 2,426 ft., Wilcox 2,725 ft., Artman zone 5,523 ft.

Newton County: R. R. Reed 1 Wade, 14-8n-10e. Dry. TD 4,900 ft.

SOUTH LOUISIANA

East Baton Rouge Parish: M. P. O'Meara 1 Kliempeter et al, 58-7s-1e. Dry. TD 10,500 ft.

Plaquemines Parish: F. A. Callery, Inc., 1 Rojas et al, 2-17s-24e (North Lafitte area). Dry. TD 10,904 ft.

St. Bernard Parish: The Texas Co. 1-A State Lease 2173, Township 13s-19e, Fox Bay. Dry. TD 11,595 ft.

St. Mary Parish: The Texas Co. 1 Farwell, 26-15s-9e. Dry. TD 12,500 ft.

NORTH LOUISIANA

Morehouse Parish: Southern Carbon 1 Marlatt, 1,300 ft. W and 1,176 ft. N SEc NE 18-20n-6e. Dry. TD 9,720 ft.

Winn Parish: H. W. Todd et al 1 Hodge-Hunt Realty Co., C SE NW SE 16-10n-1w. Dry. TD 2,680 ft.

ARKANSAS

Columbia County: Murphy Corp. 1 Bertie, C SW NE 6-19s-18w. IPF 100 BOPD, Cotton Valley 7,588-98 ft., 42°, 12/64-in. TD 8,777 ft. (Discovery tentatively named South Atlanta.)

Union County: Don D. Montgomery et al 1 El Dorado-Wesson R. R. Co., 713 ft. N and 711 ft. W of SEc SW 10-18s-16w. Dry. TD 4,105 ft.
Murphy Corp. 1 Woodward, C SW NE 22-16s-18w. IPP 35 BOPD, Hosston 4,445-57 ft., 35°. TD 6,933 ft. (Discovery tentatively named North Mt. Holly.)

OKLAHOMA

Cimarron County: Superior Oil Co. 1 Okla. State, NW NW SE 16-6n-9eCM. Dry. TD 4,753 ft.

Hughes County: Fred Morgan 1 Thos. Ryan Est., NW NW NW 15-9s-10e. Dry. TD 3,412 ft.

Kay County: Sam A. King 1 Kahle, NE NE NW 19-28n-2e. IPP 17 BOPD, Cleveland 3,185-3,223 ft. TD 3,717 ft. (Oil discovery.)

Lincoln County: Blackwell Oil & Gas Co. 1 Waldman, NW NW NE 2-15n-4e. Dry. TD 3,990 ft.

Logan County: R. M. Jordan 1 Magnolia, SE SE SE 29-15n-1e. Dry. TD 5,617 ft.
Meridian Drilling Co. and Ashland Oil & Refining Co. 1 McCorkle, SE SE SW 35-16n-1e. Dry. TD 5,378 ft.
Kay County Gas Co. 1 Bridal, NW NW SE 5-19n-4w. IPF 140 BOPD, Peru 5,292-5,308 ft. TD 6,483 ft. (New pay at N. Marshall.)

Murray County: Phillips Kouri 1 Stevenson, SE NE SW 4-1n-3e. Dry. TD 1,882 ft.

Okfuskee County: Davon & Kite 1 Mast, SW

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FACTS	EXPLANATION
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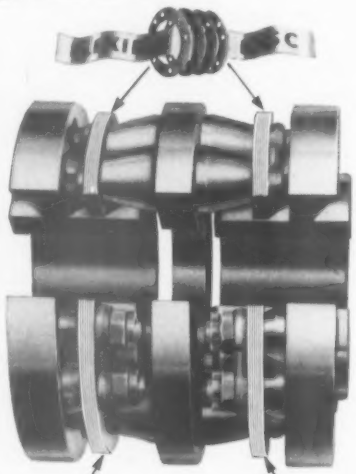

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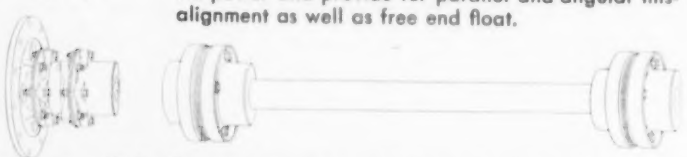

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WILDCAT COMPLETIONS

SE SW 29-12n-8e. Dry. TD 3,752 ft.

Oklahoma County: Calvert Drilling Co. and Woods Drilling Co. 1 Salisbury, SW SE NE 13-14n-4w. IPF 75 BOPD, dolomite 6,409-6,520 ft., 39 BDPD, Wilcox 6,658-62 ft., 7,800 M.c.f. gas, dolomite, 9,860 M.c.f., Wilcox 1-in. tubing choke, 15/64-in. choke, TD 6,749 ft. (Gas-Condensate disc.)

KANSAS

Barton County: Herb Buick 1 Metz, NE NE SW 33-20s-11w. Dry. TD 3,530 ft.

Butler County: Cummings-McIntyre-Aladdin 1 Dennett, NE SW SE 15-29s-3e. Dry. TD 3,118 ft.

Cowley County: J. R. McDermott 1 Hammer Bros., SE SE SE 6-33s-6e. Dry. TD 3,524 ft.

Ellis County: United Drilling Co. 1 Homburg, NE NE SE 28-11s-20w. TD 4,018 ft.

Victor Drilling Co. 1 Riechert, NW NW NE 9-15s-19w. IPP 11 BOPD, Lansing-Kansas City 3,424-50 ft. TD 3,687 ft. (Oil discovery.)

Graham County: Transit Corp.-Davis Bros. 1 Moore, SW SW NE 28-9s-22w. Dry. TD 4,070 ft.

Marion County: Mendenhall 1 Siebert, NW NW NE 11-20s-3e. Dry. TD 2,706 ft.

Drillers Producing 1 Parks, SE SE SE 22-21s-2e. Dry. TD 3,264 ft.

Reno County: Midstates 1 Siebert "C," NW NE NW 7-26s-6w. Dry. TD 4,215 ft.

Rooks County: GMR 1 Williams, CNL NE NW 6-10s-18w. IPP 288 BOPD, Lansing-Kansas City 3,409-55 ft. TD 3,760 ft. (Oil discovery.)

Petroleum, Inc., 1 Kuiken, NW NW NW 17-7s-19w. Dry. TD 3,473 ft.

Trego County: El Dorado-Rock Island 1 Owens, NE NE SE 15-11s-24w. Dry. TD 4,544 ft.

Musgrove Petroleum 1 Madden "B," SW SW NE 18-14s-21w. Dry. TD 4,115 ft.

NEBRASKA

Kimball County: Owasco field. Natural Oil & Gas 1 Robinson, CE½ SE SE 26-15n-55w. IPP 250 BOPD, "J" sand 6,002 ft. TD 6,076 ft.

Grant County: Pure Oil Co. 1 Manning, NW SW 16-23n-38w. Dry. TD 2,701 ft. Skull Creek 2,676 ft.

NORTH DAKOTA

Bottineau County: Cardinal Drilling Co. 1 Bennison et al, C SW SW 12-161n-75w. Dry. TD 3,689 ft. Jefferson 3,638 ft.

CALIFORNIA

Week ended July 25

Glenn County: Sunray Oil Corp. 1 Friesen, SE NW 19-19n-1w. IPF 6,028 M.c.f. gas daily, perfs. 4,497-4,549 ft. TD 5,000 ft. (Deeper pool discovery in Beehive Bend field.)

Kern County: Alvera Petroleum Co. 1 Alvera, 27-30s-37e. Dry. TD 700 ft.

Kern Oil Co. 46 S.P., 25-29s-29e. Dry. TD 4,879 ft. base Olcese 3,855 ft.

M. J. M. & M. Oil Co. 2 Atlantic-Koehler, 29-30s-29e. Dry. TD 7,277 ft.

Richfield Oil Corp. 1 San Emidio-B, 36-11n-21w. Dry. TD 14,238 ft.

Cliff Zillgitt 22-1 "Well," 22-9n-17w. Dry. TD 800 ft.

Los Angeles County: Carlton Beal 7 Mission-Adrian, 35-3n-16w. Dry. TD 8,008 ft.

Max Pray and Elisha Walker, Jr. 3 Gauldin Comm., 5-3s-11w. Dry. TD 8,143 ft.

Orange County: John Sandburg et al 1 Segerstrom, 9-6s-10w. Dry. TD 7,058 ft.

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WILDCAT COMPLETIONS

San Benito County: The Texas Co. 1 O'Connell-B, 34-11s-4e. Dry. TD 2,112 ft.

San Bernardino County: Chino Lease Co. 1 Mollin, 9-3s18w. Dry. TD 2,702 ft.

Santa Barbara County: The Texas Co. 1 Summers, 35-6n-33w. Dry. TD 3,563 ft.

Ventura County: Shell Oil Co. 800 Taylor, 20-3n-23w. IPF 630 BOPD, 18/64-in. choke, perfs. 11,660-12,285 ft. TD 12,375 ft. (Approx. ⅓-mile north extension to Ventura Avenue field.)

Standard Oil Co. of California 1 McInnes, 6-1n-21w. IPP 176 BOPD, 4 per cent cut, 22°, perfs. 6,280-6,370 ft. TD 9,525 ft. (Deeper pool discovery-Sespe, Oligocene—in Oxnard field.)

Yolo County: Ohio Oil Co. 1 C. R. Graf, 4-8n-1w. Dry. TD 4,610 ft.

Standard Oil Co. of California 1 Klein, 28-8n-1e. Dry. TD 5,750 ft.

Alemada County: The Texas Co. 1 T.I.Co.-Signal-Christensen, 26-2s-2e. Dry. TD 3,294 ft.

Fresno County: Valley Producing Co. 1 Well, NE NE 16-17s-18e, IPF estimated 400 BPD, 60 per cent cut, 18/64-in. bean, 38° gravity, 6,701-60 ft., TD 6,760 ft. (¼-mile northwest extension to Lanare field.)

Kern County: Chanac Associates 2 Chanac, 6-11n-17w. Dry. Basement 542 ft., TD 549 ft.

R. S. Rheem, Opr. 64-A Portals-Haddad-Butler, 3-30s-29e. Dry. TD 5,026 ft.

Richfield Oil Corp. 2 San Emidio-C, 22-10n-20w. Dry. TD 10,074 ft.

Los Angeles County: Shell Oil Co. 22-22 Bartholomae, 22-2s-9w. Dry. TD 4,022 ft.

Orange County: Max Pray 1 La Habra Community, 4-3s-10w. Dry. TD 7,700 ft.

Santa Barbara County: Intex Oil Co. 1 Franklin, 5-4n-28w. Dry. TD 2,480 ft.

Los Nietos Co. 66K-11 Los Nietos-Gulf-Philbrick, 11-9n-34w. Dry. TD 8,460 ft.

Ventura County: Richfield Oil Corp. 1 Smith-Hoffman, 21-3n-24w. Dry. TD 8,107 ft.

Yolo County: Natural Gas Corp. of Calif. 1 Peters, 9-8n-1w. Dry. TD 3,580 ft.

MONTANA

Dawson County: Iron Bluff area. Shell Oil Co. 21-15 NPRR Unit, W½ NE NW 15-13n-56e. Dry. TD 9,893 ft. Ordovician 9,090 ft.

UTAH

Carbon County: Mounds, Equity Oil Co. 3 Government-Mounds, C SW NE 18-15s-12e (SLM). IP 15,506 M.c.f. of CO_2 gas per day. TD 5,254 ft. Coconino 4,903 ft.

NORTHERN NEW MEXICO

Rio Arriba County: Magnolia Petroleum 1 Owen-Federal, NW SE SE 9-24n-2w, Lindrith area. Dry. TD 3,450 ft. Pictured Cliffs 3,337 ft.

San Juan County: Tom Bolack 1-B H. Bolack, SE NW SE 9-30n-16w. Dry. TD 1,788 ft. Dakota 1,636 ft.

COLORADO

Adams County: Somers & Dunn 1 Bone, SE SE SE 12-s-56w. Dry. TD 5,610 ft.

Roden, Darden & McRae and Trimark Oil Co. 1 Federal Land Bank, SE NW NE 6-3s-56w. Dry. TD 5,576 ft.

Archuleta County: Pagosa Junction area. Stanolind Oil & Gas Co. 1 Southern Ute, NE NW NE 22-32n-3w. Dry. TD 7,636 ft. Cutler 7,608 ft.

Logan County: Don Rounds 1 Frank, SE SE NW 20-7n-50w. Dry. TD 4,703 ft.

Pubco Development Co. 1 Rasmussen, C NW NW 5-10n-55w. Dry. TD 5,920 ft.

Morgan County: Denver Basin 1 Bollinger, NE NE NE 30-1n-55w. Dry. TD 5,118 ft.

Herndon Drilling Co. 1 Hegarty, SW NW NW 14-1n-59w. Dry. TD 7,863 ft. Big Blue 7,747 ft.

Washington County: J. M. Huber Corp. 1 Brook-Mason, SW SE NW 29-5s-56w. Dry. TD 5,266 ft.

Weld County: Buckingham Valley, Eisenhower Drilling Co. 1 Allen, C NW SE 10-7n-59w. Dry. TD 6,816 ft. Temp. abd.

C. G. Glasscock 1 Sprague Bros., N½ NW NE 23-10n-57w. Dry. TD 6,255 ft.

SASKATCHEWAN

Tide Water-Aikinsl Crown, LSD 4, 11-17-14w3. Dry. TD 4,155 ft.

British-American-Husky-Phillips 1 Burmingham, LSD 7, 29-23-7w2. Dry. TD 1,905 ft.

Shell Oil Co. A-12-25 Elswick, LSD 12, 25-4-12w2. Dry. TD 4,284 ft.

Shell Oil Co. 3 Ogeman, LSD 10, 21-4-20w2. Dry. TD 5,584 ft.

Potash Co. of America 2 Saskatoon, LSD 6, 16-36-3w3. Dry. TD 3,747 ft.

ALBERTA

Rio Prado-H. B. 8C-32 Chauvin, LSD 8, 32-43-1w4. Dry. TD 2,260 ft.

Homestead 6-26 H. B., LSD 6, 26-35-10w4. Viking oil well. TD 2,995 ft.

Hudson's Bay 1 Hercules, LSD 1, 2-52-23w4. Basal quartz (Cretaceous sand) gas well. TD 4,080 ft.

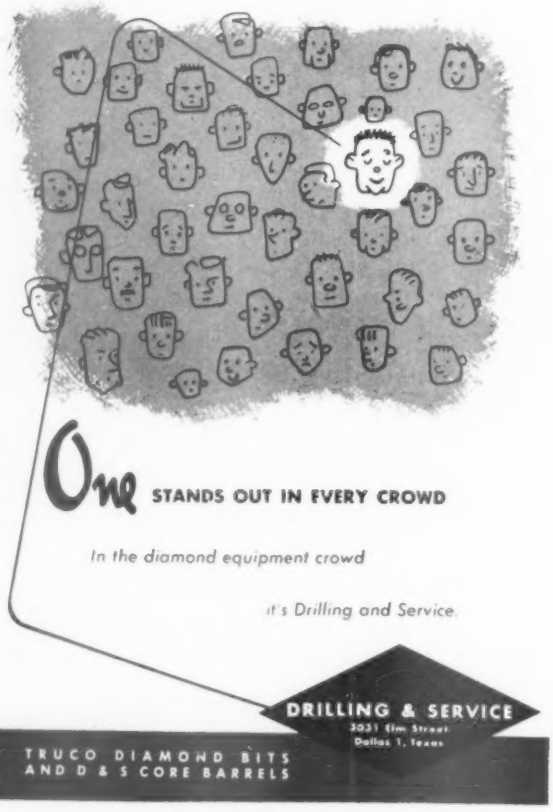
Naco 6-12 Hughenden, LSD 6, 12-40-8w4. Dry. TD 3,265 ft.

BRITISH COLUMBIA

N. F. A. 1 Buck Creek, 56° 46' N 121° 10' W (Approx.). Cadomin gas well. TD 11,424 ft.

THE OIL AND GAS JOURNAL

"Notice how nice th' old buzzard was—wish his wife was with him all th' time."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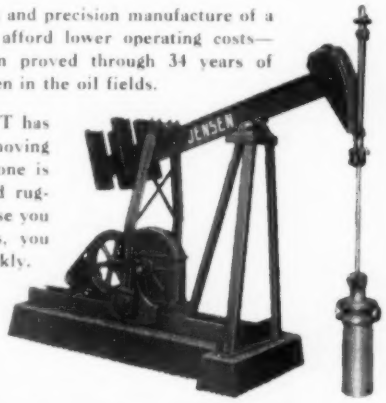

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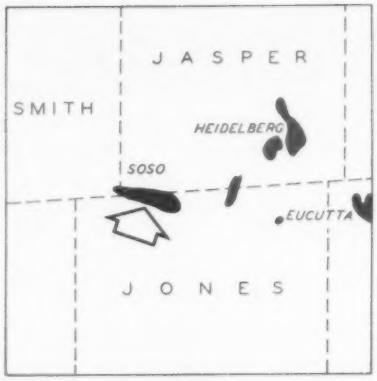
Lower Cretaceous Sand Produces in Soso Test

Testing is under way at Gulf Refining Co.'s indicated lower Cretaceous discovery well in the Soso field, in eastern Mississippi. Initial tests have been in a 3-ft. sand interval at 11,987-90 ft., the lowermost of three lower Cretaceous zones, in which oil showings were encountered. On one 6-hour test of this interval, the well flowed at the rate of 215 bbl. of 40.4°-gravity oil per day through 7/64-in. choke. The sand tested previously had been rated as the least prospective of the three zones encountered.

The indicated discovery well is 1 Bailey, located in 27-10n-13w, on the Jones County side of the three-county field, currently productive of gas and condensate from Eutaw (upper Cretaceous) sands at depths of 6,400 to 6,700 ft. It logged top of the lower Cretaceous at 8,290 ft. with surface elevation of 296 ft. Hole was carried to 12,369 ft., and has casing run to 12,207 ft.

Next tests are expected to be made in a sand at 11,958-78 ft. Best showings were encountered in a shallower zone cored from 11,421 to 11,490 ft., in which approximately 35 ft. of oil sand was logged. A 30-minute drill-stem test of a 10-ft. interval in the latter sand with bottom of the hole at 10,435 ft. recovered 4,558 ft. of 43°-gravity oil. The test was made through ¼-in. chokes and gaged 3,800 psi. flowing pressure. Net effective prospective pay sand in all cored zones totaled more than 60 ft.

Soso, discovered by Gulf Refining Co. in 1945, is located at the juncture of Jones, Jasper, and Smith counties. Developed area of the field's upper Cretaceous Eutaw sands now extends over more than 7,300 acres.



In addition to Gulf, Humble Oil & Refining Co. and Union Producing Co. are operators.

Discovery of lower Cretaceous production at Soso is considered particularly significant in view of the limited exploration which the lower Cretaceous has received in southern Mississippi. So far, production has been found only in a half dozen fields, and in these it has not been widely developed.

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New Pay for Panhandle Field in Carson Indicated

Skelly Oil Co. has a prospective new pay discovery for Panhandle field at 214 Schaffer Ranch, Section 86, Block 4, I&GN Survey, Carson County. The deep test is going to granite and at last report was coring at 4,608 ft. in dolomite after finding good oil shows at upper levels in that formation.

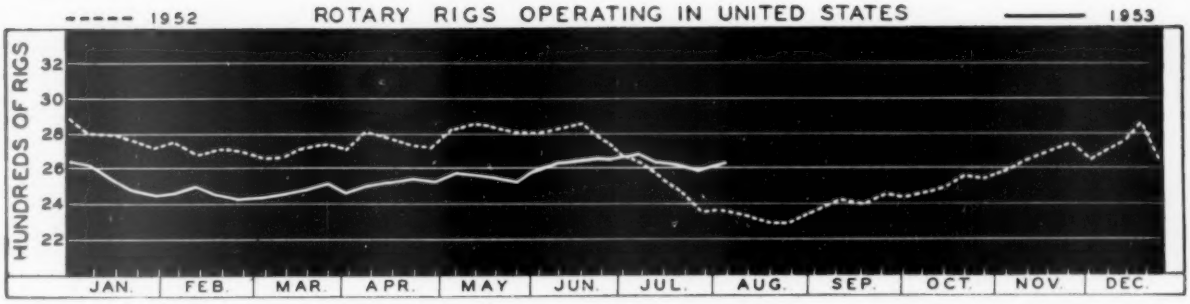
Recovery on a drill-stem test at 4,408-16 ft., open 94 minutes, was 35 ft. of oil-cut mud, flow pressure of 30 psi. and shut-in pressure of 235 psi. in 20 minutes. A good blow of air was noted. A test, open 9 minutes, from 4,414-44 ft. had a good air blow with recovery being 50 ft. of mud-cut oil. Flow pressure ranged from zero to 30 psi. Shut-in pressure was 200 psi. in 20 minutes. The last drill-stem test at 4,423-56 ft., open 1½ hours, recovered 120 ft. of mud-cut oil, about 50 per cent oil. This last test also had a good blow of air. Flow pressure ranged from zero to 50 psi. and shut-in pressure 2,270 psi. in 20 minutes.

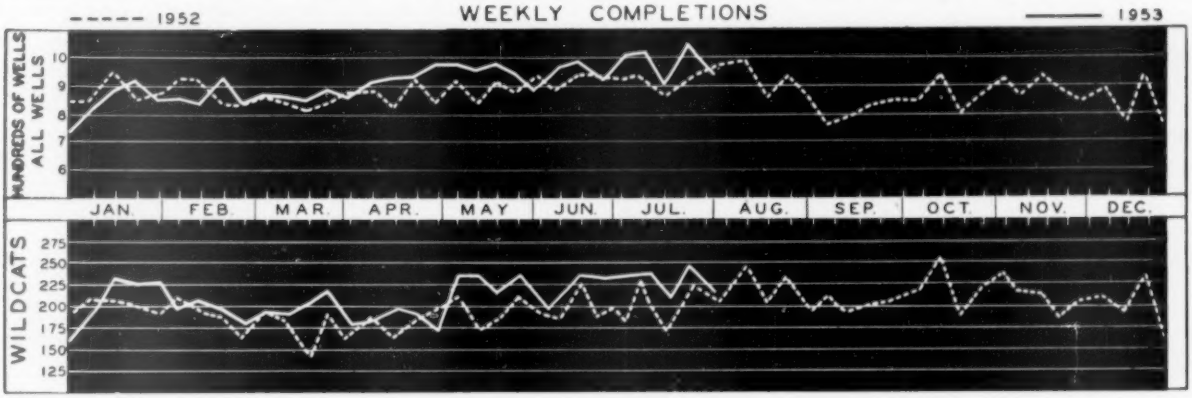
A second dolomite was found at about 4,400 ft. of possible Pennsylvanian age. Formerly wells drilled in this area drilled from the Permian dolomite at about 2,600-3,000 ft. into Pennsylvanian granite wash and then into the granite which is found at various depths. The Skelly well cored regular dolomite pay at 2,700 ft., cored to 3,002 ft. to the granite wash and then on to about 4,400 ft., finding a second dolomite. Coring continues in this dolomite.

This indicated new pay discovery is about ½ mile east of Skellytown in the northeast part of Carson County. The Panhandle field discovery well is located near at Gulf Oil Corp. 2 Burnett Ranch.

Muldon Gas Field Extended

Union Producing Co. has completed another good gas well, its fifth, in the Muldon field of Monroe County, northeastern Mississippi, in the Black Warrior basin. Its A-1-A Plant, ¾ mile southwest of the discovery well, flowed at the rate of 35,000,000 cu. ft. of gas daily from Sanders sand (Chester-Mississippian), opposite which casing is perforated at 5,476-97 ft. and 5,501-14 ft.





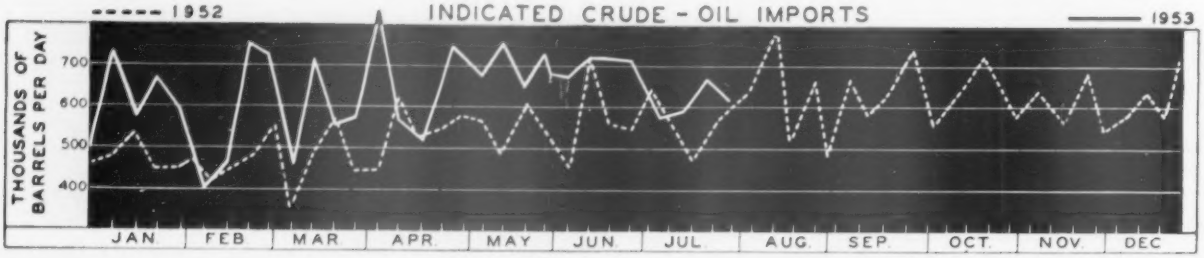
CURRENT STATISTICS

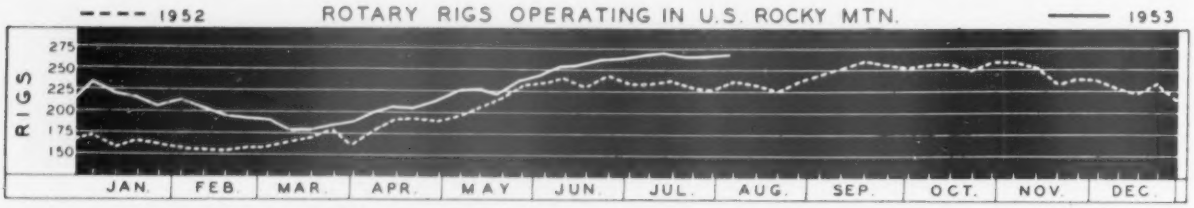
EXPLORATION

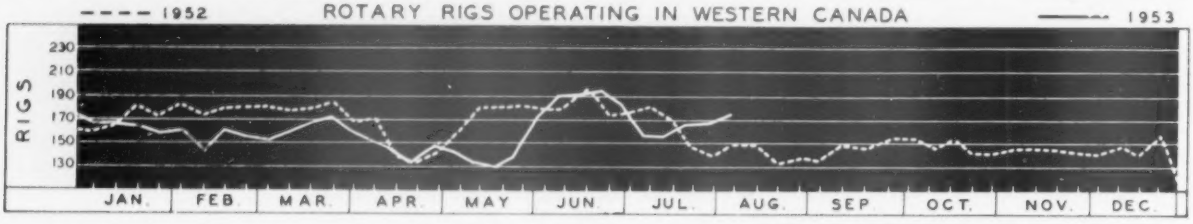
WEEKLY WELL COMPLETIONS . . .WEEK ENDED AUGUST 1, 1953

	Total of all wells					Aug. 1		Wildcat completions and discoveries					Cumulative total, 1953				
	Comp.	Oil	Gas	Dry	Footage	1953	1952	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	16	8	0	*8	23,700	412	457	0	0	0	0	0	0	0	0	0	0
Pennsylvania	42	22	6	†14	70,000	1,014	1,102	0	0	0	0	0	0	0	3	11	14
West Virginia	15	0	12	3	49,131	360	348	0	0	1	0	1	0	0	6	3	9
Ohio	20	12	3	‡5	33,166	586	605	0	0	0	0	0	2	0	1	10	13
Indiana	29	7	0	22	41,311	733	715	0	0	0	9	9	9	0	2	191	202
Kentucky	23	11	0	12	46,899	618	753	0	0	0	1	1	6	0	1	107	114
Illinois	45	18	0	27	104,470	1,071	1,120	0	0	0	13	13	4	0	0	235	239
Michigan	13	6	0	7	31,998	336	413	0	0	0	7	7	10	0	5	135	150
Kansas	75	40	1	34	254,697	2,838	2,778	2	0	0	11	13	64	0	22	439	525
Nebraska	6	3	0	3	32,303	195	135	1	0	0	1	2	14	0	3	84	101
Oklahoma	131	86	8	‡37	457,735	4,193	3,391	1	1	1	7	10	67	6	21	374	468
Texas	334	162	33	139	1,512,766	10,074	10,737	19	1	8	94	122	518	37	116	2,461	3,132
North Central (Dist. 7-B & 9)	139	79	3	57	448,486	3,790	3,460	12	0	0	34	46	271	0	11	1,004	1,286
West (Dist. 7-C & 8)	33	27	0	6	178,533	2,144	3,346	0	0	0	4	4	103	2	10	378	493
Panhandle (Dist. 10)	18	8	9	1	56,051	469	403	0	0	0	0	0	0	2	0	15	17
Eastern (Dist. 5 & 6)	19	4	5	10	106,443	473	484	0	0	0	8	8	13	2	4	163	182
Gulf Coast (Dist. 2 & 3)	66	24	9	33	448,485	1,507	1,581	5	1	5	23	34	69	14	49	391	523
Southwest (Dist. 1 & 4)	59	20	7	32	274,768	1,691	1,463	2	0	3	25	30	62	17	42	510	631
Louisiana	46	27	6	13	314,184	1,484	1,322	0	0	0	6	6	44	21	14	200	279
Northern	21	15	4	2	61,519	595	702	0	0	0	2	2	5	1	2	69	77
Southern	25	12	2	11	252,665	889	620	0	0	0	4	4	39	20	12	131	202
Arkansas	13	11	0	2	57,183	279	218	2	0	0	1	3	9	0	0	66	75
Mississippi	7	3	1	3	46,730	217	214	0	0	0	2	2	9	1	3	104	117
Southeastern States	1	1	0	0	3,542	83	39	0	0	0	0	0	1	0	0	66	67
Montana	5	3	0	2	30,603	223	144	0	0	0	1	1	5	0	0	59	64
Wyoming	8	7	0	1	49,887	378	395	0	0	0	0	0	11	0	0	66	77
Colorado	24	9	1	14	140,743	351	259	0	0	0	10	10	15	0	9	163	187
Utah	2	0	1	1	9,566	43	36	0	0	1	0	1	2	0	3	24	29
New Mexico	38	12	22	4	184,972	768	614	1	0	0	3	4	11	0	7	69	87
California	40	30	0	10	186,417	1,483	1,433	1	0	0	10	11	36	0	5	332	373
North Dakota	5	4	0	1	37,331	149	33	0	0	0	1	1	7	0	0	30	37
Miscellaneous	0	0	0	0	0	36	76	0	0	0	0	0	1	0	1	28	30
Total United States	938	482	94	362	3,719,334	27,924	§27,337	27	2	11	177	217	845	65	222	5,257	6,389
Total previous week	1,045	525	81	439	4,182,548			26	4	10	208	248	818	63	211	5,080	6,172
Total August 2, 1952	973	494	68	411	3,792,069			31	0	3	172	206	826	52	147	4,867	5,892

Service wells included: *8, †12, ‡1. §Revised.



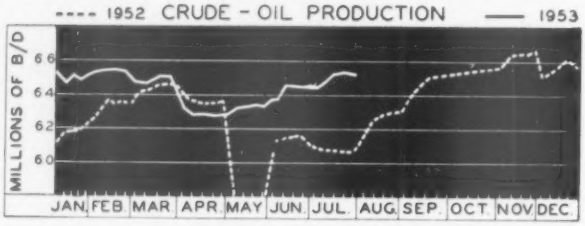


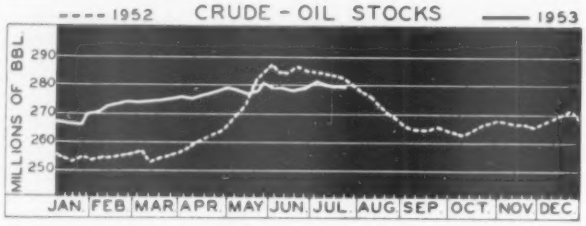


DAILY AVERAGE PRODUCTION FOR WEEK

	August 1			July 25
	Crude oil	Lease condensate	Total	total
Alabama	5,200		5,200	5,100
Arkansas	76,000	450	76,450	76,800
California	1,016,200		1,016,200	1,015,400
Colorado	110,200		110,200	107,400
Eastern	59,200		59,200	59,200
Florida	1,550		1,550	1,550
Illinois	157,800		157,800	157,100
Indiana	35,000		35,000	34,600
Kansas	329,200		329,200	340,800
Kentucky	32,000		32,000	30,400
Louisiana	670,300	40,500	710,800	711,750
North	104,650	2,500	107,150	108,100
South	565,650	38,000	603,650	603,650
Michigan	32,400		32,400	33,500
Mississippi	92,350	3,300	95,650	95,900
Montana	30,800		30,800	30,500
Nebraska	13,900		13,900	14,000
New Mexico	196,800	850	197,650	197,750
Oklahoma	549,100		549,100	547,400
Texas	2,805,625	44,800	2,850,425	2,850,425
Dist. 1	38,150	300	38,450	38,450
Dist. 2	155,350	6,000	161,350	161,350
Dist. 3	453,400	22,200	475,600	475,600
Dist. 4	266,000	6,000	272,000	272,000
Dist. 5	49,650	350	50,000	50,000
Dist. 6	126,200	5,050	131,250	131,250
East Texas field	247,500		247,500	247,500
Dist. 7-B	117,800	50	117,850	117,850
Dist. 7-C	162,050	4,000	166,050	166,050
Dist. 8	928,525	400	928,925	928,925
Dist. 9	184,500	400	184,900	184,900
Dist. 10	76,500	50	76,550	76,550
Utah	5,400		5,400	5,300
Wyoming	210,500		210,500	210,300
North Dakota	14,700		14,700	14,200
Total U. S.	6,444,225	89,900	6,534,125	6,539,375
Change from previous week			down 5,250	
Canada	280,950		280,950	285,000
Total U. S. production January 1			1,371,668,800 bbl.	
Same period last year (crude plus cond.)			*1,307,440,650 bbl.	

*Includes 18,863,635 bbl. condensate.



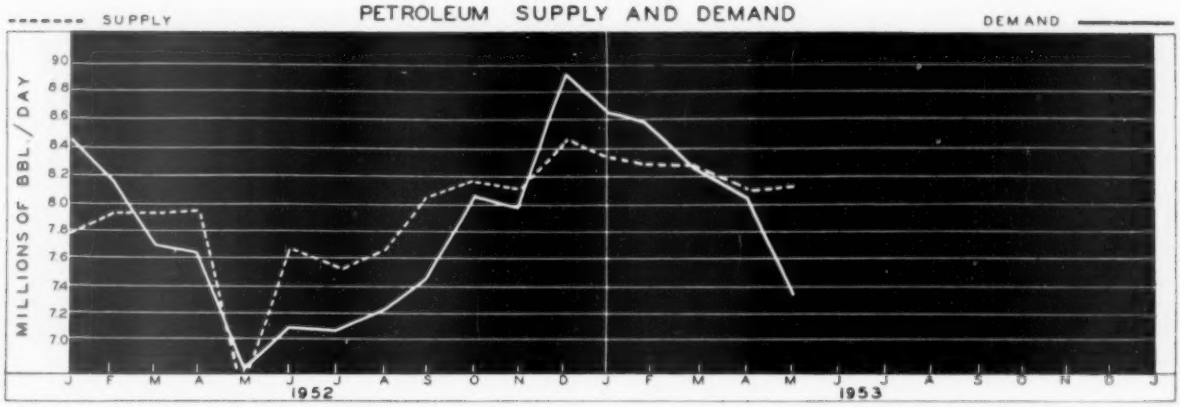


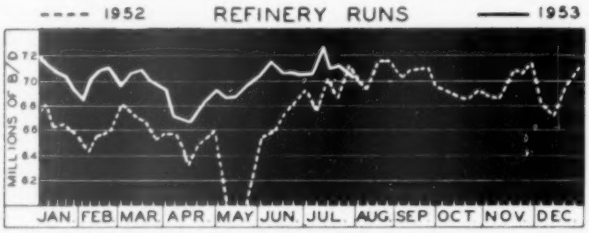
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

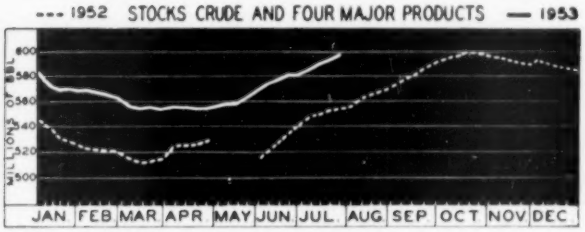
(Thousands of barrels)

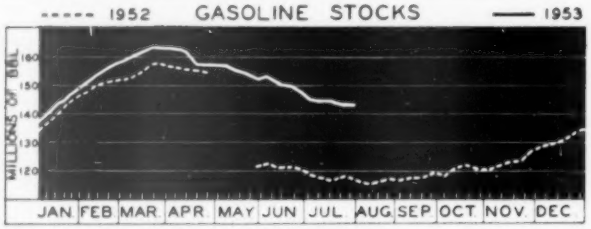
	July 25, '53	July 18, '53	July 26, '52
Pennsylvania Grade	1,611	2,549	2,598
Other Appalachian	2,027	2,054	2,165
Illinois, Indiana, Michigan	12,325	12,130	12,861
Arkansas	2,931	2,802	2,833
Louisiana	15,298	15,414	15,480
North	2,313	2,450	2,544
Gulf	12,985	12,964	12,936
Mississippi	3,569	3,724	3,356
New Mexico	7,446	7,109	7,880
Oklahoma and Kansas	38,611	39,099	41,470
Texas	134,839	134,147	135,897
East Texas proper	11,345	11,057	13,069
West Texas	61,807	63,195	59,453
Texas Gulf	27,953	26,383	29,457
Other Texas	33,734	33,512	33,918
Rocky Mountain	17,224	17,133	14,660
California	33,297	33,528	31,254
Foreign	†9,932	9,940	7,747
Total	279,110	279,629	278,201

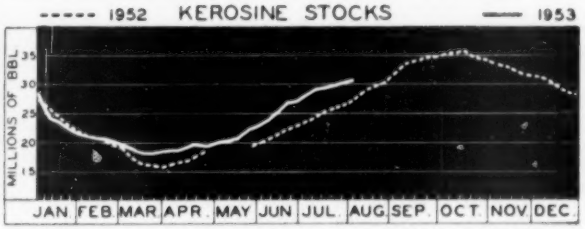
*Bureau of Mines. †Includes 2,437,000 bbl. in California.

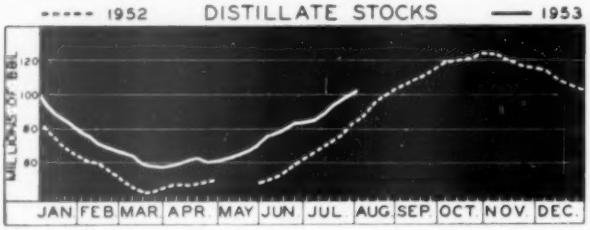


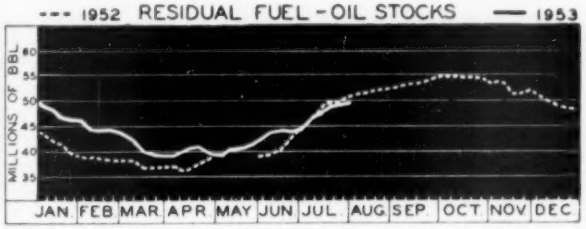










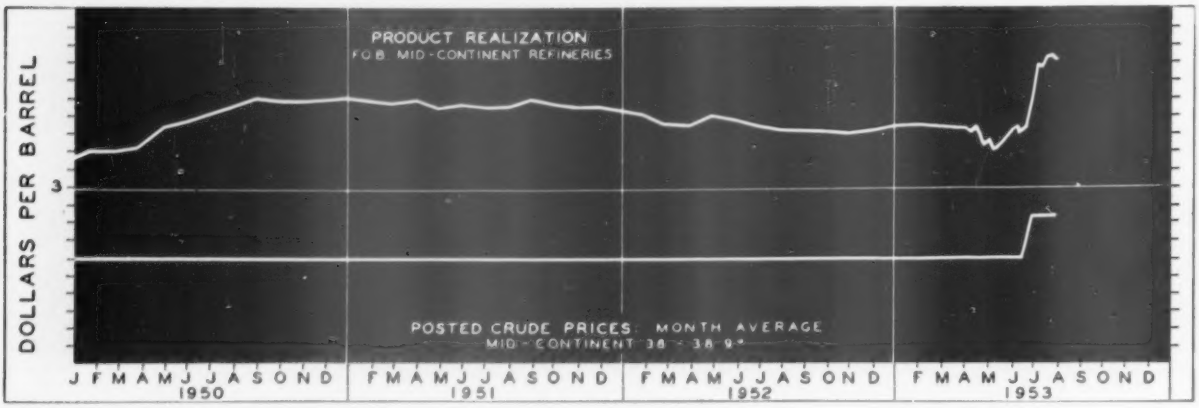


A.P.I. REFINERY REPORT, AUGUST 1

(Thousands of barrels)

District—	Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid	Stocks‡—Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, August 1952—Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid.
East Coast	1,076	460.3	36.2	243.9	236.6	33,775	12,633	34,656	12,506	1,062	428.9	48.0	239.5	225.2
Appalachian:														
District 1	106	46.1	4.4	19.3	14.4	3,369	541	1,131	677	105	42.3	5.0	14.0	9.3
District 2	94	52.3	8.6	7.3	11.2	1,419	434	498	150	76	41.7	1.7	15.4	14.2
Ind., Ill., Ky.	1,271	696.6	69.2	208.7	156.4	28,428	6,937	17,061	3,943	1,350	708.6	78.5	247.7	167.5
Okla., Kans., Mo.	628	367.7	23.1	141.1	53.3	14,864	2,142	11,221	1,248	610	342.7	16.0	143.7	60.3
Inland Texas	267	186.2	11.1	52.1	37.6	5,925	554	1,815	1,552	258	172.4	12.3	45.1	36.4
Texas Gulf Coast	1,604	798.9	115.0	346.7	222.4	19,133	3,696	14,064	7,285	1,738	781.3	139.4	442.0	282.0
La. Gulf Coast	559	297.3	48.6	130.9	55.3	7,801	2,547	6,648	1,680	527	248.4	55.7	141.1	56.2
N. La. and Ark.	82	35.4	5.7	22.7	7.6	3,063	549	749	128	86	34.0	6.5	21.4	6.1
Rocky Mountain:														
New Mexico	19	12.4		2.9	3.7	190		38	30	19	12.1	0.2	2.9	3.9
Other Rocky Mtn.	254	122.7	2.7	57.4	42.7	5,375	281	2,402	926	243	113.3	5.3	45.9	41.9
California	1,064	464.6	6.0	163.3	385.4	20,081	418	12,368	19,422	1,044	451.1	6.2	155.3	349.3
Aug. 1, 1953	7,024	3,540.4	330.6	1,396.3	1,226.6	143,423	30,732	102,651	49,547	7,118	3,376.8	374.8	1,514.0	1,252.3
July 25, 1953	7,125	3,564.9	316.0	1,431.9	1,254.0	143,446	30,312	98,114	48,886					
Aug. 2, 1952	7,033	3,331.1	382.6	1,501.4	1,220.6	116,243	27,638	86,128	51,414					

*At refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit, and in pipe lines.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38° - 38.9°
J F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952
F M A M J J A S O N D
1953

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate and fuel oil. Realization averaged $3.72 for week ended July 25, $3.76 for previous week, and $3.36 for July 1952. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of August 5, 1953. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline	11¼-11⅝	13-13.8	11.25-11.75
Premium gasoline	12⅜-12⅞	14.5-14.8	12.5-12.75
42-44 w.w. kerosine	8.875-9.25	10.15-10.4	9.125-9.5
No. 2 straw fuel oil	7.875-8.25	8.9-9.4	8.25-8.5
No. 6 residual	$1.05-1.20	$2.15-2.40	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.60	6.10	6.35

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13.75
750 vis., No. 3-4 neutral	16.75
2,000 No. 5-6 neutral	18.5-18.75

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	21.5
200 vis., No. 3 neutral, 0-10 pp.	14.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	25.5
180 vis., 10 p.t. neutral	27.5

WAX

Mid-Continent

132-134 A.M.P.	6.0

GROUP 3 gasoline quotations may be lower if discounting continues at some pipe-line terminals to the north. In past years a strong summer market for gasoline would result in prices at northern pipe-line terminals amounting to the Group 3 low plus 0.25 cent plus pipe-line transportation. In a tight market the price would be Group 3 plus 0.5 cent. Material is available at the low plus pipe-line transportation, and in a few cases impending demurrage charges have forced sales at 0.125 cent under the low.

With more than half of the big gasoline season past, there seems to be little chance of any firming in the gasoline market. Rumors of contracts covering deliveries for the balance of the year indicate that suppliers are not expecting better than the low plus pipeline transportation for late summer and early fall.

Very little distillate has been reported moving to secondary storage in any of the market areas of the country. Since the summer discount period on the East Coast runs through September, many of the jobbers are waiting to see if further softness develops in the market. No. 2 distillate is available in New York Harbor at 8.9 cents a gallon on the spot market. This price is about 0.25 cent less than postings and 0.10 cent less than spot prices before the crude price increase in June.

Distillate prices on the Gulf Coast reflect the lack of sales and additions to storage over the past few weeks. No. 2 distillate is reported to be available at prices ranging from 8 cents to 8.25 cents. Demand for gasoline at the Gulf Coast is down from early June.

Coastwise tanker rates for dirty vessels are reported at USMC minus 25 per cent compared with USMC minus 45 per cent early in July.

Pennsylvania Grade crude prices increased 13 cents to 15 cents a barrel. Bradford crude is now $4.55 a barrel.

CRUDE PRICES GRAVITY SCHEDULE

	Signal Hill, Calif.*	Oklahoma, Kansas	Gulf Coast Tex.†	West Tex.‡
14-14.9	$1.87			
15-15.9	1.93			
16-16.9	1.99			
17-17.9	2.05			
18-18.9	2.11			
19-19.9	2.18			
20-20.9	2.24	$2.50		$2.37
21-21.9	2.30	2.52		2.39
22-22.9	2.37	2.54		2.41
23-23.9	2.45	2.56		2.43
24-24.9	2.53	2.58	$2.91	2.45
25-25.9	2.61	2.60	2.93	2.47
26-26.9	2.69	2.62	2.95	2.49
27-27.9	2.76	2.64	2.97	2.51
28-28.9	2.83	2.66	2.99	2.53
29-29.9	2.91	2.68	3.01	2.55
30-30.9	2.97	2.70	3.03	2.57
31-31.9	3.04	2.72	3.05	2.59
32-32.9	3.12	2.74	3.07	2.61
33-33.9		2.76	3.09	2.63
34-34.9		2.78	3.11	2.65
35-35.9		2.80	3.13	2.67
36-36.9		2.82	3.15	2.69
37-37.9		2.84	3.17	2.71
38-38.9		2.86	3.19	2.73
39-39.9		2.88	3.21	2.75
40 and above		2.90	3.23	2.77

*Standard Oil Co. of California. †Upper Texas Gulf Coast. ‡Includes New Mexico Permian.

Prices East of California effective June 15, 1953. California prices effective February 16, 1953. Pennsylvania Grade prices effective August 3, 1953.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

Louisiana:	
Cotton Valley (distillate)	$3.00
Cotton Valley (Holloway crude)	2.95
Texas:	
East Texas	2.90
Chapel Hill	2.83
Conroe	3.13
Van	2.73
Pennsylvania Grade:	
Bradford	4.55
Southwest Pennsylvania	4.11
West Virginia	4.05
Illinois Basin	3.02

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FOR SALE: 10,000′—4½″ drill pipe, with tool joints cut off, located at Hobbs, New Mexico. Makin Drilling Company, Box 1628, Hobbs, New Mexico.

WICHITA Falls Spudder Model 61, Le Roi engine, butane equipped. Will drill to depth 5,000′, cleanout work to 6,500′. Tools from 10″ to 5″. Includes assortment of stems, bailers, spiral and regular bits, Swann underreamers, and Wilson elevators. All types of fishing tools. New Kohler light plant, steel tool house. Complete in every respect. Rig good as new. Priced reasonable. Inventory furnished upon request. Write or call George Proctor, Phone 2-6663, 307 City National Building, Wichita Falls, Texas.

JOY 300 Drilling Rig butane powered, mounted on Brockaway 6x6 truck, 3500 feet 3½ inch drill pipe. Auxiliary mud pump and butane engine as separate unit. All tools and equipment included. This rig in first-class working condition and ready to go to work immediately. Call or write Steele Brothers, Crete, Nebraska. Phone 127.

USED PIPE FOR SALE

We have been taking up several miles of our oil and gas lines in this district and have for sale considerable very good used pipe, as listed below:

2,500′ 6⅝″ o.d. bevelled. Good.
15,000′ 6″ o.d. straight, bevelled. Good.
12,000′ 5⅝″ o.d. straight, bevelled and good.
4,000′ 4½″ o.d. very heavy.
15,000′ 4″ o.d. steel pipe.
1,500′ 3″ i.d. very heavy; splendid casing.
4,000′ 2½″ plain end, good as new.
20,000′ 2″ long collars, good threads, straight line pipe.
5,000′ 2″ oil well tubing.
2,000′ ⅜″ pipe.
700′ 4⅞″ casing.
2,000′ 6¼″ casing.

THE ALLEN GAS CORPORATION
Paola, Kansas

Large Diameter NEW STEEL PIPE

8⅝″ O.D. .250 wall 1250 feet
8⅝″ O.D. .352 wall 1080 feet
9⅝″ O.D. .395 wall 800 feet
14″ O.D. .250 wall 400 feet
24″ O.D. .281 wall 4500 feet
24″ O.D. .406 wall 1500 feet
26″ O.D. .281 wall 2400 feet
28″ O.D. .281 wall 1500 feet
30″ O.D. .500 wall 3000 feet

All 40 foot lengths
Small size pipe and tubing also available
Attractively Priced
for Immediate Shipment

SONKEN-GALAMBA CORPORATION
2nd and Riverview (X-964)
Kansas City 18, Kansas
ATwater 9305

EQUIPMENT FOR SALE

ROTARY RIG, Late Model Bethlehem, Air Controls, complete with 10,000′ drill pipe, now running on 10,000′ well. Will sell or take 3500′ rig in trade. P. O. Box 2574 or telephone 4-4222, Tulsa, Oklahoma.

FOR SALE: 1—36-P Oilwell 3″ x 6″ Triplex Power Pump with bronze fluid end, porcelain plungers and slush type valves. Can also furnish Electric Motor, controls, drive, skids, etc. This item priced for quick sale. Box G-609, The Oil and Gas Journal, Tulsa, Oklahoma.

Gaso Duplex 4½″ x 6″ Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

USED LINE PIPE FOR SALE

17 miles 10¾″ OD Electric Weld 28.04# PE BFW. Approx. length 37′. 51 miles 8⅝″ OD Seamless 23.57# PE BFW. Approx. length 35′. 10 miles 6⅝″ OD Seamless 17.02# PE BFW. Approx. length 35′. We consider the above first-class merchandise.

BETHLEHEM SUPPLY CO.
Box 2171, Tulsa, Oklahoma
PHONE 5-9261, Ext. 361

FOR SALE OIL COUNTRY LATHES

One (1) 27″x24′ bed (16′ centers) American, Heavy Duty, Geared Head, 12 spindle speeds, 12″ hole in spindle, complete with 2 chucks, 2 steady rests, taper attachment, oil pan, etc. Late type machine with Timken Bearings.

Two (2) 30″x40′ bed (33′ centers) Betts-Bridgeford Lathes, Geared Head, 12 spindle speeds, 11″ hole in spindle, complete with 2 chucks, 2 steady rests, taper attachment, oil pan, etc. Late type machines with Timken Bearings.

In stock at

The Eastern Machinery Co.
1014 Tennessee Ave.
Cincinnati 29, Ohio
Phone: MElrose 1241

EQUIPMENT FOR SALE

EVERYTHING in new and used equipment for well drilling. Fishing tools rented. Save money, get quotations from Pressey & Son, Pueblo, Colorado.

FOR SALE: 5—Shriver 42″x42″ cast iron Filter Presses, Plate & Frame Type, 27, and 54 chambers 1″ cake; 15—Sperry 18″x18″ cast iron Filter Presses, 11 chambers; #12 Sweetland Filter for 72 monel covered leaves on 2″ centers. Immediate shipment. Attractively priced. Consolidated Products Co., Inc., 17-20 Park Row, New York 38, N. Y. BArclay 7-0600.

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New and Used material—Immediate delivery from stock, Angles, Channels, I and WF Beams, especially for construction needs.

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Phone or Wire your steel requirements.

We are also interested in purchasing your surplus material. We assure you our prices will be the best obtainable.

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ROTARY RIGS FOR SALE

WILSON GIANT "ROADAIR"
BETHLEHEM TWISTER

Both Rigs Have
131′ & 126′ Lee C. Moore Masts with substructures, Diesel Twin 6 GMC's compounded, 214-P Oilwell mud pumps, 4½″ drill pipe, shale shakers and mud pits. Operating currently West Texas. Complete inventory furnished upon request Box 176, Salem, Illinois.

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FASTER from FOSTER

STANDARD • MERCHANT
LAP WELD • SEAMLESS
BUTT WELD • SPIRAL WELD

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HOUSTON 2, TEX. CHICAGO 4, ILL.
PITTSBURGH 30, PA. NEW YORK 7, N.Y.

EQUIPMENT FOR SALE

FOR SALE: NEW 4½" OD 16.60# Grade "D" Youngstown External Upset Drill Pipe Threaded for Hughes Seal Grip Tool Joints: 4036'—$229.54 C Ft. our Great Bend, Kansas, Yard. 4043'—$228.84 C Ft. our Chase, Kansas, Yard. NEW 4½" OD 16.60# Grade "D" External Upset Youngstown Drill Pipe Threaded API. 4034'—198.18 C Ft. our El Dorado, Kansas, Yard. All subject to prior sale. Buckeye Supply Co., Phone 20, El Dorado, Kansas.

FOR SALE: Complete Rig now operating Cardwell Model D. Drawworks, GM 6 Power, 6x16 pump, oil well table, 2 dog houses, trailer house, welding equipment. Inventory on request. Post Office Box 403, Phone 4-2081, Wichita, Kansas.

FOR SALE: 60,000 4½ o.d. s.s. line, 60,000 3½ o.d. line all new. 5—55,000 bbl. tanks. 5—10,000 and 5—5,000 tanks. Lundquist Pipe & Supply Co. Phone 5-8850, Tulsa, Okla. P. O. Box 1215.

FOR SALE: Three large complete power drilling rigs for estate of Al Buchanan Drilling Co. Contact Turner Briggs, Phone Monroe 5-6000, Houston, Texas.

SALES and rentals of cable drilling and fishing tools, casing and equipment, from the Southwest's largest stock of used cable tools and oil field supplies. Degen Pipe and Supply Co., Tulsa, Oklahoma.

1—GAK 145 H.P. Waukesha, with twin disc clutch 10" sheave completely overhauled. New crankshaft and never been used since overhauling. $2500.00. 1900 ft. 3½" bottle neck drill pipe, very good cond. $1.45 per ft. 6—V belts like new, #6340 Type C. $35.00. 1—4"-40' squire kelly, needs some repair, but good for 2000 ft. drilling, $150.00. Box G-616, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Used PDM-36 Emsco Drawworks with all Chains and Guards TD Reverse Clutch Enclosed Chain Drive Compound Unit with TD Pump Clutch. All Mounted on extra heavy I Beam Skids with 2-D13000 Caterpillar Engines equipped with Caterpillar Clutches, Stub Shafts & Flexible Couplings & Caterpillar Starting Engines. 1—26'x14'x14" I Beam Skid Base for Jackknife derrick. Complete price $7500.00. Buckeye Supply Company, Phone 4381, Great Bend, Kansas.

FOR SALE: 1951 Cessna 195; 245 HP; 400 total hours; Cross-wind Gear; VHF; OMNI; Gyros; Hangared; Brand new condition; one owner; $12,500.00; write Box G-582, The Oil and Gas Journal, Tulsa, Oklahoma.

4,000' NEW NATIONAL 3½" drill pipe—make offer. 7,000' used tuboscoped grade 2 4½" drill pipe—make offer. 16—6¼" drill collars, guaranteed perfect—make offer. 2—7¼" drill collars, as above—make offer. 1 WAK Waukesha, skid mounted, new torque converter—$2,500, will consider less for cash. 7P Wilson-Snyder pump, completely overhauled, guaranteed, $5,000. 1949 White "28" truck, with tandem float, winch. Just overhauled, new tires complete. $5,000. SW&H Drilling Company, Box 664, Midland, Texas. Phone 22111.

FOR SALE: New enclosed gear power pumps National Transit taking liners 5 x 10 to 3 x 10 now equipped five inch liners one pump 665 pounds with five inch 1500 pounds three inch and one pump 920 pounds five inch 1500 pounds 3½ inch far below dealers cost. Box 1082, Wichita Falls, Texas.

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Established contracting company has limited number of openings with good future for well qualified interpretative personnel. Give all details of education and experience in reply.

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Tulsa, Oklahoma

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Growing natural gas company located in north central area has opening for gas engineer experienced in preparation of material for presentation before regulatory bodies and in natural gas transmission or distribution operations. Salary commensurate with ability and experience. Replies confidential.

Box G-611, The Oil and Gas Journal,
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PLANT SUPERINTENDENT wanted for small gasoline plant. Must have good engine operation background. State experience in full. Box G-604, The Oil and Gas Journal, Tulsa, Oklahoma.

FOREIGN EMPLOYMENT. List of oil companies and drilling contractors showing where to apply for foreign jobs. OIML Co., Box 2603, Tulsa, Okla. $5.00 cash.

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WANTED: Graduate electrical, civil or mechanical engineer for office and field work by major oil company in Middle West. Please state age, experience and educational qualifications. Box G-619, The Oil and Gas Journal, Tulsa, Oklahoma.

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Growing natural gas company located in north central area has opening for recent graduate for engineering work in connection with natural gas transmission and distribution operations. Some experience in field desirable but not essential. Salary commensurate with ability and experience. Replies confidential.

Box G-612, The Oil and Gas Journal, Tulsa 1, Oklahoma

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LANDMAN: Seven years experience all phases field operations and office procedures major company land department. Presently assigned to field. College and legal background. Licensed attorney. Location optional and extensive travel satisfactory. Desires change to expanding production company or substantial independent operator. Box G-598, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628, Ph. No. 3-3141, Hobbs, New Mexico.

CHEMICAL ENGINEER with 6 years supervisory experience in mud control and drilling problems desires job with good future and probable stable location. Married, age 34. Box G-613, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN desires new connection. Right-of-way experience, veteran, 27, married, college background. References. Box G-605, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST — Desires position with independent or small oil company as sole geophysicist or directly under chief geophysicist. Eight years seismic plus five years electronic experience. For seismic crew supervision and record review. Box G-607, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN, presently employed major oil Co., 5 years experience all phases land work, age 32, LLB degree. Desires position in Texas with independent. Box G-629, The Oil and Gas Journal, Tulsa, Oklahoma.

COLONEL, 53 years old, retiring from the Air Force August 31 desires position. Well experienced in office management and accounting. Past four years comptroller for one of the largest Air Force bases. Write care of Box G-623, The Oil and Gas Journal, Tulsa, Oklahoma.

AREA LANDMAN desires change, 8 years experience in Williston Basin, Mid-Continent, Canada, Rocky Mountain Areas. Thoroughly experienced in lease purchasing, title curing, farmouts, office management, etc. Box G-621, The Oil and Gas Journal, Tulsa, Oklahoma.

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PRODUCING ROYALTY and overrides for sale. Wire-write-call for particulars. JACK EAGLE, 706 City Natl. Bldg., Okla. City, Okla. REgent 6-7027.

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EQUIPMENT MEN . . . in the News

Promotions and Transfers Announced by BJ Service

The following recent promotions and transfers have been announced by John B. Merritt, BP Service, Inc., executive vice president.

O. N. Andrew has been promoted from wire-line supervisor to division manager, Pacific Coast division; C. R. Cross promoted from development engineer to district superintendent, Valley district, Bakersfield, Calif.; W. D. Sauer, promoted from service engineer to sales engineer at the Williston, N. D., station; B. J. Bates, Casper, Wyo., district superintendent, promoted to district superintendent, Williston. The Williston district includes the Bottineau and Tioga, N. D., and Glendive, Mont., stations.

W. R. Wilson, service engineer, Casper, has been promoted to service supervisor, Casper; R. L. Johnston, sales engineer, Long Beach, Calif., promoted to field man in charge of station at Glendive, Mont.; L. M. Tholkes, transferred from Glendive, Mont., to Williston, as service supervisor in charge of the station.

Arch Courtney, operations manager, Texas division, has been transferred to Hobbs, N. M., as district superintendent in charge of Hobbs district, which includes Lovington, N. M., and Seagraves, Tex., stations; C. S. Ludwig, station supervisor at Hobbs, reassigned as sales engineer, Hobbs, and R. P. Kirkpatrick, sales engineer, wire-line department, Odessa, Tex., has been transferred to Tioga, N. D., as service supervisor in charge of substation.

Jones & Laughlin Announces Canadian Personnel Changes

The following changes in personnel affecting Canadian operations have been recently announced by Jones & Laughlin Steel Corp., Supply Division, Tulsa.

Preston V. Edwards, formerly of Williston, N. D., is now assistant manager of Canadian operations with headquarters at Calgary, Alta.

Ivor K. Thomas, a former Jones & Laughlin employe, has rejoined the organization as a special assistant credit manager with headquarters also at Calgary.

Edwards originally entered the employ of J.&L. at Hutchinson, Kan., in 1941, and with the exception of 2 years in military service, he has been continuously employed by this company in several Kansas assignments and, more recently, as representative in the Williston basin area.

Thomas, for the last 5 years, has been in the employ of another supply company. He has had wide experience in the oil-field-supply business as a credit-department representative.

W. C. Kinder To Direct All Emsco Mfg. Sales

Appointment of William C. Kinder as vice president in charge of all Emsco Manufacturing Co. sales is announced by William T. Powell, president.

For the past 12 years, Kinder has been in charge of manufacturing and sales of the D+B Division of Emsco, and 3 years ago transferred from Los Angeles to Garland, Tex., upon the completion of the new D+B plant at Garland.

In his new position, Kinder will be responsible for the sale of all Emsco and D+B products, and in connection with oil-field-equipment sales will take over the duties of J. T. Tucker, general sales manager, who resigned effective July 16.

Iverson Announces Changes In Field Sales Staff

S. J. Iverson, president of Iverson Supply Co., has announced the following changes in personnel for the company.

Hugo Zimmer, former manager of the Salem, Ill., store has been transferred to Farmington, N. M., as a field salesman. Ernest Lambert, formerly store manager at Price, Utah, has been transferred to Farmington where he will serve as store manager.

Al Iverson, Jr., formerly field salesman, has assumed the management of the store at Price. John Spain, formerly store man at Salem, Ill., has been transferred to Farmington, where he will serve in the same capacity.

Amercoat Relocates Houston Branch Offices, Warehouse

Amercoat Corp., manufacturers of Amercoat line of protective coatings for industrial applications, has relocated its branch offices and warehouse in new and larger quarters at Houston, according to G. E. Seidel, executive vice president of the company.

The new branch offices, opened June 1, 1953, are located in Houston's expanding Supply Row Center industrial area where other national firms have recently established facilities to better serve the growing southern industrial market.

Lucien L. Miner, Amercoat district manager, will be in charge of operations at the new location. Amercoat formerly maintained its south central branch at Dallas. The company's home office and plant are located at South Gate, Calif. Additional offices and warehouses are maintained at Chicago, Newark, N. J., and Jacksonville, Fla.

Hydro-Test, Inc., Appoints Two New Representatives

Hydro-Test, Inc., of Long Beach, Calif., has expanded its facilities for testing tubing by the recent appointment of two new representatives, Tube Testers, Inc., Wichita Falls, Tex., and McAdams Pipe & Supply Co., Great Bend, Kans. The Hydro-Test method of testing tubing under hydraulic pressure while being run back into the well is available also in the Gulf Coast, Houston, Kilgore, and Odessa, Tex., Oklahoma City, and California districts.

Tube Testers, operating from Wichita Falls, is headed by Paul Jamison and Clayton Hamm, formerly field representatives for Worth-Well Surveys out of Odessa. They service nine counties in southern Oklahoma and North Central Texas.

McAdams Pipe recently moved to Great Bend and secured Hydro-Test for that district.

Taylor Instrument Assigns Larsen, Bell to New Posts

Taylor Instrument Companies, of Rochester, N. Y., has assigned two of its industrial sales representatives to new territories under the jurisdiction of the Tulsa office.

Byron W. Larsen is now making his headquarters in New Orleans, and his territory covers portions of southern Louisiana, extreme southern part of Mississippi, and the counties of Mobile and Baldwin in Alabama.

Lloyd Bell has been assigned to a territory centering around Amarillo, Tex., where he will cover the western third of southern Kansas, West Texas, and a portion of New Mexico.

Kramer Is Appointed by Cleaner Pipelines Co.

Cleaner Pipelines Co., manufacturers of expansible internal pipe-line cleaners, spring-loaded cleaners, night caps, squeegees, and other pipe-line accessories, has announced the appointment of A. P. Kramer as sales and service manager.

For the past 5 years Kramer was associated with Great Lakes Pipe Line Co. and for the last 3 years was the company's general superintendent in charge of the operating department. Prior to this he was sales and service representative for American Locomotive Co. in the diesel-engine division.

In his new capacity Kramer will direct the activities of Cleaner Pipelines Co., with headquarters at North Kansas City, Mo.

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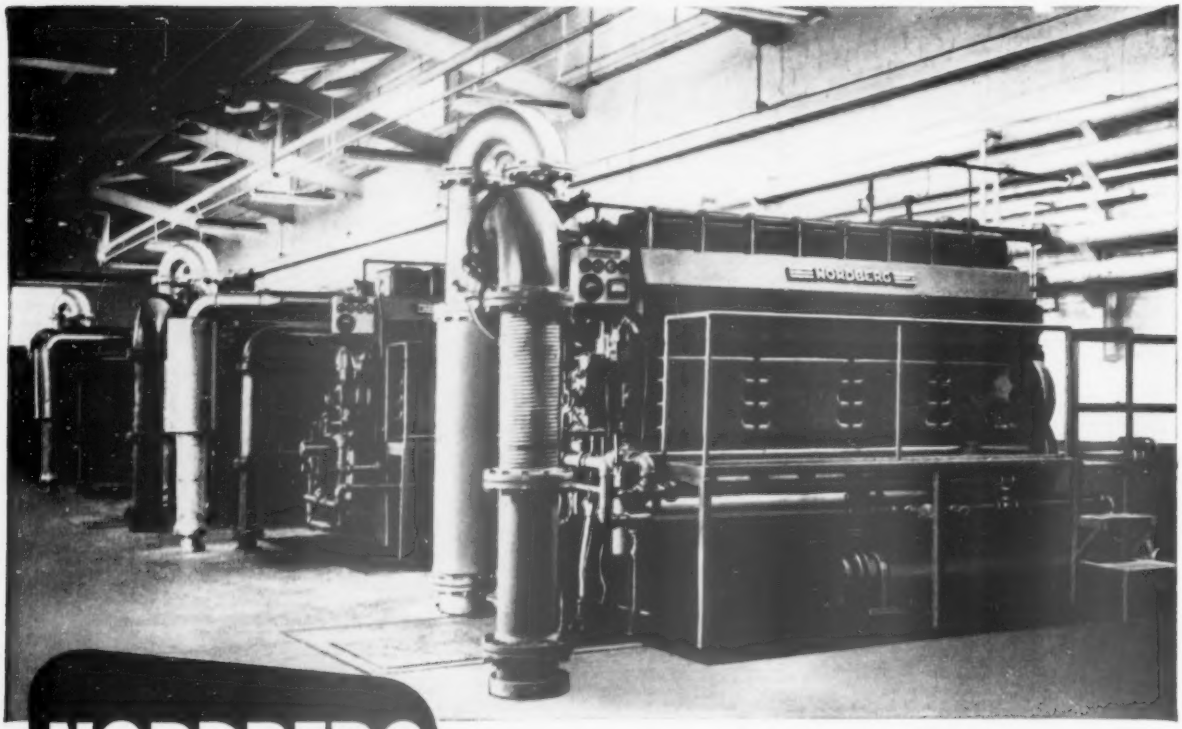
LEGAL

Notice is hereby given that sealed bids on oil and gas leases on 57,429.53 acres of allotted and Tribal Indian lands on the Fort Peck Indian Reservation will be opened at 2:00 o'clock P.M., Mountain Standard Time, August 25, 1953, in the office of the Superintendent, Fort Peck Indian Agency, Poplar, Montana. Those individuals desiring specific information in connection with this sale of leases may contact Mr. James D. Crawford, Superintendent, Fort Peck Agency, Poplar, Montana.



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. . . for positive protection against joint leakage and creep!

. . . for a tighter seal as pump pressures and tension loads increase!

. . . for replacement ease because worn joints can be removed and replaced with new, right at your rig!

. . . for trouble free drilling because of the four points of seal!

4 POINT SEAL PROTECTION!

1—STABILIZER FLUID SEAL

2—THREAD TENSION SEAL

3—INSIDE FLUID SEAL

4—SHOULDER FLUID SEAL

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